No. 3382

United States

Circuit Court of Appeals

For the Ninth Circuit.

NORTHERN IDAHO AND MONTANA POWER COMPANY, a Corporation,

Plaintiff in Error,

vs.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Defendant in Error.

Transcript of Record.

Upon Writ of Error to the United States District Court of the District of Montana.

Filmer Bros. Co. Print, 330 Jackson St., S. F., Cal.

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[Clerk's Note: When deemed likely to be of an important nature, errors or doubtful matters appearing in the original certified record are printed literally in italic; and, likewise, cancelled matter appearing in the original certified record is printed and cancelled herein accordingly. When possible, an omission from the text is indicated by printing in italic the two words between which the omission seems to occur.]

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Names and Addresses of Attorneys of Record.

BENJAMIN S. GROSSCUP, Esq., of Tacoma, Wash.,

SIDNEY M. LOGAN, Esq., of Kalispell, Mont.,

Attorneys for Defendant and Plaintiff in Error.

J. E. ERICKSON, Esq., of Kalispell, Mont.,

T. H. MacDONALD, Esq., of Kalispell, Mont.,

HENRY C. SMITH, Esq., of Helena, Mont.,

Attorneys for Plaintiff and Defendant in Error. [1*]

In the District Court of the United States in and for the District of Montana.

No. 583.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Plaintiff,

vs.

THE NORTHERN IDAHO & MONTANA POWER COMPANY, a Corporation,

Defendant.

BE IT REMEMBERED, that on March 23, 1917, a transcript on removal of the above-entitled cause from the District Court of the Eleventh Judicial District of the State of Montana, in and for the county of Flathead, was filed in the United States District Court for the District of Montana, the plaintiff's

*Page number appearing at foot of page of original certified Transcript of Record.

complaint contained in said transcript on removal, being in the words and figures following, to wit: [2]

In the District Court of the Eleventh Judicial District of the State of Montana, in and for the County of Flathead.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Plaintiff,

vs.

THE NORTHERN IDAHO & MONTANA POWER COMPANY, a Corporation,

Defendant.

Complaint.

Plaintiff complains and alleges:

1. That the said plaintiff is a corporation organized and existing under and by virtue of the laws of the State of Montana and doing business in the said State of Montana, with its principal office and place of business at Columbia Falls, Flathead County, Montana.

2. That the defendant, Northern Idaho & Montana Power Company is a corporation, organized, existing and doing business under and by virtue of the laws of the State of Delaware, and doing business within the State of Montana, having its principal office and place of business at Kalispell, Flathead County, Montana.

3. That at all times hereinafter mentioned, the defendant, Northern Idaho & Montana Power Com-

pany, was and now is engaged in the business of generating, producing and distributing electricity and selling and applying the same for lighting, power and other purposes, to the general public for profit; and said company, at all times hereinafter mentioned, owned, controlled and maintained in the county of Flathead, Montana, an electrical plant for generating and distributing electricity to its patrons, customers and others with whom it had contractual relations.

4. That on the 25th day of December, 1916, for a valuable consideration and for the compensation demanded, defendant was engaged in supplying the plaintiff at its mill and place of business [3] above described, electricity for lighting and power purposes; that it was the duty of the defendant in furnishing said electricity, to at all times have and maintain a safe plant, machinery, poles, wires, conduits, converter boxes, transformers, fuses, plugs, and other necessary electrical apparatus, for the proper and safe generation, transmission and distribution of electricity to its patrons and customers, and especially to this plaintiff; and it was also its duty to inspect and examine the same at all reasonable times and intervals and at all times to keep and maintain the same in good repair and in safe condition, so that the plaintiff might at all times use the said electricity for power and lighting purposes, safely, without danger of loss, damage or injury to its property and premises.

5. That on the said 25th day of December, 1916, and for a long time prior thereto, the said defendant

did not discharge its duties heretofore described, but in violation of its said duties, carelessly, negligently and unskillfully wired said premises, and carelessly, negligently and unskillfully installed said electrical apparatus and appurtenances, and carelessly and negligently failed to keep and maintain the same in good repair, and carelessly and negligently permitted the said electrical apparatus and fixtures to become worn, damaged and defective, all of which was well known to the defendant, its agents, and employees; and by reason of said carelessness and negligence, such great voltage or load of electricity was carried to and upon the wires upon and within the premises of the plaintiff, and by reason of said excessive voltage and overloading of wires, and without any fault of the plaintiff, the said building, contents and property of the plaintiff heretofore described, on the morning of the 25th of December, 1916, caught fire from an electrical current furnished by the defendant, and the said building and property hereinbefore [4] described, were entirely destroyed, to the damage of plaintiff in the sum of $30,500.00.

6. That at the time of the burning of plaintiff's mill and property, as aforesaid, plaintiff was supplying lumber and lumber products to the trade along the line of the Great Northern Railway and its branch lines, in Montana and North Dakota, and had an established line of customers in said territory; that by reason of the burning and destruction of the property, as aforesaid, and by reason of the said carelessness and negligence of the defendant, plaintiff has been compelled to suspend business and has been de-

prived of means of supplying the trade and its customers with the products of its mill and factory, as aforesaid, to its further damage in the sum of $10,000.00.

WHEREFORE, plaintiff demands judgment for the sum of $40,500.00 and costs and disbursements of this suit.

FOOT & MacDONALD,
J. E. ERICKSON,
Attorneys for Plaintiff.

(Duly verified.)

Filed Feb. 24, 1917. R. N. Eaton, Clerk District Court. Filed Mar. 23, 1917. Geo. W. Sproule, Clerk U. S. Court. [5]

That the defendant's answer, contained in said transcript on removal, is in the words and figures following, to wit: [6]

(Title of Court and Cause.)

Answer.

Comes now the defendant in the above-entitled action and for answer to the complaint of the plaintiff herein:

1. Denies each and every allegation, matter and thing in said complaint contained, alleged or set forth not hereinafter generally or specifically admitted or denied.

2. Admits the allegations of paragraphs 1, 2, and 3 of said complaint.

3. Defendant admits that on 25th of December,

1916, for a valuable consideration and for the compensation demanded, the defendant was engaged in supplying the plaintiff at its mill and place of business described in said complaint, electricity for lighting and power purposes; but denies that it was the duty of defendant in furnishing said, or any, electricity, or otherwise, or at all, to, at all times, or at all, have or maintain a safe plant, machinery, poles, wires, conduits, converter-boxes, transformers, fuses, plugs, or other necessary, or any, electrical, or any, apparatus for the proper or safe, or any generation, transmission, or distribution of electricity to its patrons or customers or especially, or at all, to the said plaintiff; and denies that it was, also, or at all, its duty to inspect or examine same at all reasonable, or any times or intervals, or at all, or any times to keep or maintain the same in good, or any [7] repair or safe, or any condition, so that the plaintiff might at all, or any, times use the said electricity for power or lighting, or any purposes, safely, or otherwise without danger or loss, damage or injury to the property or premises, or otherwise, or at all.

4. Defendant denies each and every allegation, matter and thing contained, alleged or set forth in paragraph five (5) of said complaint.

5. Answering paragraph six (6) of said complaint and as to whether at the time of burning of plaintiff's mill or property as alleged in said complaint, or at any other time, or at all, plaintiff was supplying lumber or lumber products to the trade, or otherwise, along the line of the Great Northern Railway or its branch lines in Montana and North Dakota or either

of said states, or elsewhere, or otherwise, or at all, or had established a line of customers in said territory or elsewhere, or at all, or that by reason of the burning or destruction of the property mentioned in said complaint, or otherwise, or at all, or by reason of the said, or any carelessness and negligence of the defendant, or otherwise, plaintiff has been compelled to suspend business or has been deprived of means of supplying the trade or its customers with the products of its mill or factory, or otherwise, or at all, to its further damage in the sum of $10,000.00 or any other sum or amount whatsoever, this defendant denies that it has any knowledge or information sufficient to form a belief and defendant further denies that any loss, which said plaintiff has sustained by reason of any fact alleged in said paragraph six (6), or otherwise, or at all, has been sustained by reason of carelessness or negligence of this defendant.

6. Further answering said paragraph six of said complaint the defendant avers that said paragraph does not state facts sufficient to constitute cause of action against this defendant. Further answering said complaint as a whole the defendant avers that said complaint does not state facts sufficient to constitute cause of [8] action against this defendant.

WHEREFORE, defendant prays judgment for its costs of suit.

LOGAN & CHILD,
Attorneys for Defendant.

(Duly verified.)

Filed Mar. 16, 1917. R. N. Eaton, Clerk District Court. Filed Mar. 23, 1917. Geo. W. Sproule, Clerk U. S. Court. [9]

The petition for removal, contained in said transcript on removal, is in the words and figures following, to wit:

(Title of Court and Cause.)

Petition for Removal.

To the Honorable the District Court of the Eleventh Judicial District of the State of Montana, in and for the County of Flathead:

The petition of the Northern Idaho and Montana Power Company, the defendant in said above-entitled cause, respectfully shows and represents to this Honorable Court:

1. That your petitioner is the sole and only defendant in said above-entitled cause, and that the said action has been commenced against your petitioner by the plaintiff, the A. L. Jordan Lumber Company, in said above-entitled court, and the said action is now pending therein for recovery in favor of said plaintiff and against this defendant in the sum of $40,500.00 damages and the costs of the action upon an alleged liability for general and special damages, it being alleged in said plaintiff's complaint that on or about the 25th day of December, 1916, for a valuable consideration and for the compensation demanded, defendant was a company organized for the purpose of selling and distributing electricity to its

customers and was engaged in supplying the plaintiff at its certain saw mill in Flathead County, Montana, electricity for lighting and power purposes, and that it was the duty of the defendant, in furnishing such electricity, to at all times have and maintain a safe plant, machinery and equipment, and that on said 25th day of December, 1916, and for a long time prior thereto this defendant did not discharge its duty as set forth in said complaint, but in violation of [10] said duty carelessly, negligently and unskillfully wired the premises of the plaintiff, and carelessly, negligently, and unskillfully installed certain electrical apparatus and appurtenances, and carelessly and negligently failed to keep same in good repair, and carelessly and negligently permitted the said electrical apparatus and fixtures to become worn, damaged, and defective, by reason thereof the said premises and property caught fire and was entirely destroyed, to the damage of the plaintiff in the sum above mentioned, all of which is fully shown and set forth in plaintiff's complaint on file herein, to which reference is hereby made.

2. That your petitioner disputes the claim made by said plaintiff and denies any and all liability to said plaintiff on account of the destruction and loss of said mill, property, and premises.

3. That said action is and involves a controversy wholly between citizens of different states. That said action was begun against your petitioner in said above-entitled court on the 24th day of February, 1917. That when said action was commenced, said plaintiff was, ever since has been, and now is a cor-

poration, organized and existing under the laws of the State of Montana, and during all of said times was a citizen of the State of Montana, and was not at any of said times a citizen of any other state of the United States of America. That your petitioner, this defendant, the Northern Idaho & Montana Power Company, at the time of the commencement of this action, was, ever since has been and now is a corporation duly organized and existing under and by virtue of the laws of the State of Delaware and at all of said times was and now is a citizen of said State of Delaware, and that at all times was and now is a citizen of a State of the United States other than the State of Montana.

4. That said action is of a civil nature and the matter and amount in dispute herein between said plaintiff on the one side [11] and said defendant on the other, exceeds, exclusive of interest and costs, the sum of $3,000.00, and it is a cause removable to the United States District Court for the District of Montana, by virtue of the provisions of the statutes of the United States, upon the ground of the diversity of citizenship of the said plaintiff on the one side and said defendant on the other side.

5. That your petitioner was served with summons in said action in the city of Kalispell, county of Flathead, State of Montana, on the 26th day of February, 1917, and the time in which your petitioner is required to appear in said action has not yet expired.

6. That your petitioner herewith presents a good and sufficient bond as provided and required by the statute in such case made and provided, that it will

enter in the District Court of the United States for the District of Montana, within thirty days of filing this petition for removal, a certified copy of the record of this action and for payment of all costs that may be awarded by said District Court of the United States for the District of Montana, if said District Court of the United States shall hold that said above-entitled cause was wrongfully and improperly removed thereto.

WHEREFORE, your petitioner prays that this action be removed to the District Court of the United States in and for the District of Montana, that this Honorable Court accept this petition and said bond and proceed no further in said cause, except to make order for the removal of said cause to said District Court of the United States for the District of Montana.

NORTHERN IDAHO & MONTANA POWER CO.,

By SIDNEY M. LOGAN,

Its Attorney Thereto Duly Authorized.

LOGAN & CHILD,

Attorneys for Petitioner.

(Duly verified.)

Filed Mar. 16, 1917. R. M. Eaton, Clerk District Court. Filed Mar. 23, 1917. Geo. W. Sproule, Clerk U. S. Court. [12]

Thereafter, on March, 11, 1918, a stipulation to amend the complaint was duly filed herein, in the words and figures following, to wit:

(Title of Court and Cause.)

Stipulation to Amend Complaint.

IT IS HEREBY STIPULATED AND AGREED by and between the above-named parties, through their attorneys, C. H. Foot and J. E. Erickson for plaintiff, and Logan and Child for the defendant, that the plaintiff's complaint herein be amended by adding to the said complaint paragraph 3a as follows:

> 3A. That on the twenty-fifth day of December, one thousand nine hundred sixteen, and for a long time prior thereto, the plaintiff owned and operated a planing-mill at Columbia Falls, Montana, said mill and plant being located on the Northwest Quarter of Section Nine, Township Thirty North, of Range Twenty West, Flathead County, Montana. That said plaintiff was, on said day, and had been for a long time prior thereto, engaged in the manufacture of lumber and lumber products and buying and selling the same both wholesale and retail. That for the purpose of conducting said business, said plaintiff, on said date, owned and occupied certain buildings on said above described premises, to wit: Main building, 44x55 ft., workroom 20x70 ft., filing-room 20x26 ft., said building being of the aggregate value of Sixty-five Hundred Dollars; that upon said date above mentioned, the

plaintiff had a stock of lumber and lumber products on hand on said premises and in said buildings, of the value of Three Thousand Dollars; that installed within said buildings were machinery, tools and equipment for the purpose of carrying on said business of the value of Twenty-one Thousand Dollars. [13]

IT IS FURTHER STIPULATED AND AGREED by and between the said parties that each and every allegation, matter and thing contained in said paragraph 3a is to be deemed as denied by the defendant.

J. E. ERICKSON,
C. H. FOOT,
Attorneys for Plaintiff.
LOGAN & CHILD,
Attorneys for Defendant.

Filed March 11, 1918. C. R. Garlow, Clerk. [14]

Thereupon, pursuant to said stipulation, the complaint was amended by adding thereto paragraph 3–A as follows:

Amendment to Complaint.

"3–A. That on the twenty-fifth day of December, one thousand nine hundred sixteen, and for a long time prior thereto, the plaintiff owned and operated a planing-mill at Columbia Falls, Montana, said mill and plant being located on the Northwest Quarter of Section Nine, Township Thirty North, of Range Twenty West, Flathead

County, Montana. That said plaintiff was, on said day, and had been for a long time prior thereto, engaged in the manufacture of lumber and lumber products and buying and selling the same, both wholesale and retail. That for the purpose of conducting said business, said plaintiff, on said date, owned and occupied certain buildings on said above-described premises, to wit: Main Building, 44x55 ft., workroom 20x70 ft., filing-room 20x26 ft., said buildings being of the aggregate value of Sixty-five Hundred Dollars; that upon said date above-mentioned, the plaintiff had a stock of lumber and lumber products on hand on said premises in said buildings, of the value of Three Thousand Dollars. That installed within said buildings were machinery, tools and equipment for the purpose of carrying on said business of the value of Twenty-one Thousand Dollars." [15]

Thereafter, on February 3d, 1919, the opinion of the Court was duly filed herein, which appears hereinafter in the bill of exceptions, and on February 5th, 1919, judgment was duly rendered and entered as follows, to wit: [16]

(Title of Court and Cause.)

#583.

Judgment by the Court.

This cause came on regularly for trial on the 30th day of March, 1918, J. E. Erickson, T. H. McDonald

and Henry C. Smith, Esqs., appearing as counsel for plaintiff, and Logan, Child and Grosscup, Esqs., for the defendant. A trial by jury having been expressly waived by the respective parties, the cause was tried before the Court, sitting without a jury, whereupon witnesses on the part of plaintiff and defendant were duly sworn and examined. The evidence being closed, the cause was submitted to the Court for consideration and decision, and after due deliberation thereon, the Court orders that judgment be entered herein in favor of the plaintiff and against the defendant for the sum of $34,500.

WHEREFORE, by reason of the law and premises aforesaid, it is ordered, adjudged and decreed that A. L. Jordan Lumber Company, the plaintiff do have and recover of and from Northern Idaho and Montana Power Company, a Corporation, the defendant the said sum of Thirty-four Thousand Five Hundred ($34,500.) Dollars. Together with said plaintiff's costs and disbursements incurred in this action, amounting to the sum of $577.40 *Dollars.*

Judgment rendered February 5th, 1919.

C. R. GARLOW,
Clerk. [17]

Thereafter, on June 13th, 1919, bill of exceptions was duly settled and allowed, and filed herein, being in the words and figures following, to wit: [18]

In the District Court of the United States for the District of Montana.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Plaintiff,

vs.

NORTHERN IDAHO & MONTANA POWER COMPANY, a Corporation,

Defendant.

Bill of Exceptions.

APPEARANCES:

HENRY C. SMITH, J. E. ERICKSON, T. H. McDONALD, for Plaintiff.

B. S. GROSSCUP, SIDNEY M. LOGAN, for Defendant. [19]

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WITNESSES.

DEFENDANTS.

WITNESSES.

In the District Court of the United States for the District of Montana.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Plaintiff,

vs.

NORTHERN IDAHO & MONTANA POWER COMPANY, a Corporation,

Defendant.

Bill of Exceptions.

BE IT REMEMBERED, that this cause, coming on regularly to be heard in the March term of the above-entitled court, on Saturday, the 30th day of March, 1918, before the Court, Hon. George M. Bourquin, a jury having been waived by the parties, Messrs. Foot & McDonald, Hon. J. E. Erickson and

Hon. Henry C. Smith, appearing on behalf of the plaintiff, and B. S. Grosscup and Sidney M. Logan, Esqs., appearing on behalf of the defendant, the following testimony and none other was offered and introduced, and the following proceedings had, to wit:

Testimony of A. L. Jordan, for Plaintiff.

A. L. JORDAN, a witness herein, having been first duly sworn, appeared on behalf of the plaintiff and testified as follows:

Direct Examination by Mr. ERICKSON.

My name is A. L. Jordan. I reside at Columbia Falls; am president and manager of the plaintiff corporation in this case, and have been since it was organized in 1917. The A. L. Jordan Lumber Company own this property for about five years before it was burned down. The company also owned the plant and stock of lumber. We were engaged in the business of wholesaling and retailing. We were manufacturing lumber into various products, such as outside doors and window frames, and boxes of all kinds, crating, sills, mouldings, and interior finishing, and selling the same by wholesale and retail, and that was the kind of business [23] we were conducting on December *20*, 1916. On the night of that date it caught fire and burned down completely. The fire occurred between twelve o'clock midnight and one o'clock A. M., the morning of December 25th.

The main building was built in somewhat of an "L" shape, and what would be the arm of the "L" was about forty to fifty-five feet and the forming of

(Testimony of A. L. Jordan.)

the "L" portion of the mill was about twenty to thirty feet. There was a lien to on what would be the south end of the mill about 12x18.

Approximately west and a little north of the factory at a distance of about one hundred and ten feet was a little cottage; this cottage was not destroyed. I have described all the property that was destroyed and have a list of the machinery.

(List offered and marked Exhibit 1.)

(Note on this writ of error defendant offers no controversy as to the amount of damages established by plaintiff as hereinafter shown.)

(Witness continues:) Salvage received out of this stuff amounted to $241.60.

Mr. ERICKSON.—Mark this document Plaintiff's Exhibit 2.

(Document marked by reporter.)

Q. I am showing you Plaintiff's Exhibit No. 2. Will you tell the Court what it is?

A. I drew this diagram myself. The upper portion of the map shows the floor plan, and the black lines is the outline, while the red lines represent as near as memory could place it, the lighting circuit that was installed in the plant at the time. The lower portion of the map shows the south elevation view as near as I could represent it in a crude way, together with the relative position of the wires as they led into the mill supplying the power and light, coming from [24] the transformer stationed near the mill. In the left-hand corner it shows the small house I testified to. Just west of the mill is two black dots, noted as the transformer poles. This is

(Testimony of A. L. Jordan.)

a correct representation of the mill and the other objects I have detailed here to the best of my memory.

Letting the upper portion of the map represent north, the railroad tracks and the depot would be south from the location of the mill.

The wind was blowing from a northeasterly direction. There was about two feet of snow on the ground. There was some snow on the roof; I do not know how much.

Q. But it was covered, however?

A. There was snow on the roof.

When I arrived at the fire, looking at the elevation or lower portion of the prospectus here, the cupola part of the roof was all fire. This portion up here (indicating) was all afire and the roof of the whole length of the mill. The wiring entered the building on the south end. At a point A. (Indicating on Exhibit 2.) That was a power lead. The lighting circuit entered the mill at a point B (indicating on map). The transformers are indicated by the point C; the south end elevation and also at point C on the floor elevation. The lightning-arresters were within three hundred feet of the mill. I did not measure the distance exactly. The transformers were about forty-eight feet from the mill.

My last visit to the mill before the fire was about one o'clock P. M. on Sunday, the 24th. The mill was securely locked and closed. I carried one key to the door and my night watch had access to the other. When I left the mill at one o'clock, I locked and closed the building. There was not any fire in the

(Testimony of A. L. Jordan.)

stove at that time. In the working-room [25] there was a stove and one also in the filing-room. I had brick chimneys. For a foundation we had brick and a corrugated iron back around the stove, and also around the floor. Smoking around the building was absolutely prohibited. The power lead was open; that is, the light was on. The lighting system was closed; that is, the power was off. The transformers were on poles and supports leading from one pole to another. There were three transformers about twelve feet above the ground.

When I arrived at the fire that night, there were some people around there. They were running around there, but I did not take an inventory of just what everybody was doing. I was awful busy. When I got there I got the 2½-inch fire hose out of the house and connected it with the hydrant,—one is at the northeast corner of the floor plant of my mill, and proceeded to extinguish the fire to the best of my knowledge. The fire department was called and part of it got there. But it was no use. When I turned the water on and I came around the wind was blowing right over the buildings, and the dry-shed, which was full of lumber and other manufacturing stuff, and it was impossible to save the building.

A. Who installed these electrical appliances outside the mill?

A. The Power Company. In 1910 the installation started.

Q. Now, you may describe the installation at the time of the fire, in the interior of the mill,—that is, the installation.

(Testimony of A. L. Jordan.)

A. The wiring was all done in conduit. That is, iron pipes. We had about nineteen drops altogether. Conduit pipes are prescribed by the Board of Underwriters for the safe carrying of the wires to the various connections. I couldn't give you the composition, but it looks to me like iron. [26]

The COURT.—Do you mean that they are entirely enclosed in these pipes,—the wires?

The WITNESS.—Well, they couldn't lead right up to a motor. There is a prescribed distance to which you can lead up to a motor, but on the end of the pipe there would be the outlet of the conduit to make the connection to a motor, or a starting box or a switch, but the balance of the way it was really in this conduit. The drops were not the ordinary drop-cord. It was a special cord, prescribed by the Board of Underwriters. The mill was wired to conform to the rules of the Board of Underwriters. The Board of Underwriters are the examiners of all insurance policies, I believe, written in the state in what is called Board Companies, and they examine the conditions and various risks and report to the agents and companies as to the fire risks.

The doors leading into the portion of the mill-room connected with the resaw, was locked on the outside with a Yale lock. I have the lock with me. While the other doors were closed on the inside, and securely fastened by a hasp or hook-and-eye. They were locked when I went there Sunday morning.

The WITNESS.—Exhibit 3 is the padlock that was on the entrance at the south end of the mill where

(Testimony of A. L. Jordan.)

we passed through into the mill. I found it out in the ashes at the location of the door after the fire.

We had trouble with the lights in the mill. We had trouble with them burning out. They became crippled so that they wouldn't light. I complained to the power company about that. They furnished me with higher voltage lights. The lighting circuit was wired for 110 volts. They furnished me with lights, the cartons of which were marked 122. It [27] means 122 kilowatt,—higher than 110, 12 K. W. higher. These lights did not stand up.

Q. And then what happened?

A. Well, they were in use at the time the mill burned. The employees of the mill used light from this lighting system, also one family that was renting one of the houses. They had the same trouble with the lights that we had at the mill, and when the machinery would be running the lights would be dim, and when the power line was open and no machines were running, the lights would be very bright. And one of the houses used an electric flat-iron and that became very hot and to such an extent that they could not use it. It would get very hot two or three minutes after the current was on.

We had seven motors in that building. The leads of the motors were all marked 220 volts. We could have run them all at the same time, but we did not, very seldom. All of the machines wouldn't be in use at the same time. Each motor was on a separate switch. It was the custom to keep the mill clean. The mill wasn't dusted. Dust accumulated around the ceilings and electrical appliances more or less,

(Testimony of A. L. Jordan.)

to clean out the dust. They operated by a blowing system. That is for blowing the ordinary dust from each machine. It is sucked up to the blower. The blower itself is a large fan that revolves at high speed, and is so constructed that it gathers or sucks the dust from various machines and passes it through these fans to the opposite side or what is called the blowing part and blows it out. It operates locally at each machine where it is connected, and only draws the shavings and dust from the machine. It does not reach up to the beams and girders and joists and rafters and pick up that dust. We had no system of cleaning out that dust in the mill outside of this suction arrangement which I speak of. So that the dust had accumulated throughout all this period which I speak of.

I reside about one mile in a southerly or southeasterly direction from the mill. About 12:10, the night of the fire, [30] I was called and notified that the mill was burning. In going to the mill I had to face this terrific storm blowing from the northeast. The snow was drifted. The average depth was about two feet. It took me twelve or fifteen minutes to get to the mill. Four miles an hour is the average walking rate for a man. I arrived at the mill at about 12:25 or somewhere around there. The fire was blazing all over the mill at that time. The material was falling in all the time. I couldn't look in the windows and see any distance, it was all smoke and blazing. I had windows all along both sides. They were just ordinary windows; there might have been one or two that would slide up and down.

(Testimony of A. L. Jordan.)

Q. How often did you inspect your windows to see whether they were securely fastened, or did you ever inspect them for that purpose?

A. I was around every day. I don't remember inspecting the windows.

The drop-cords on the lamps used in the mill differed in lengths. Probably from two to five feet. The mill is one story high. The blower machine was up over the lower floor and then there was a basement where the motors were. There was a platform on which the blower and the little motor was used. The rest of the room was exposed to the rough rafters. We had a few joists across from pillar to pillar with no floor on them. There was, I believe, a plank to walk on, but they were just narrow gangways to walk on, but there was no substantial flooring other than those joists. I cannot say whether the conduits were run along over these joists. That is, those that lay right over the machine. Part of these conduits were on the rafters and part on the joists. [31]

I first noticed that the lights would get dim when the motors were in service about a year before the fire, about the time the bank of the transformers was put in. I could not give the exact date. And that was continuous every time I shut off the motors and left the lights burning,—they would brighten up; every time I coupled up the motors the lights would get dim.

Cross-examination.

(By Mr. ERICKSON.)

Q. You say that some changes were made on the inside with respect to motors?

(Testimony of A. L. Jordan.)

A. Yes; there were changes being made right along ever since the electric power was put in. I cannot say how long it was before the fire that changes were put in, but I presume it was within a year. When I saw this transformer on fire, oil was bubbling out and burning. The transformer was about forty-eight feet from the building. Flames extended over from the building towards the transformers. The wind was blowing from that direction. They couldn't get within twenty feet of the transformer.

Witness excused. [32]

Testimony of William Werner, for Plaintiff.

WILLIAM WERNER, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Erickson, and testified as follows:

My name is William Werner. I reside at Columbia Falls, Montana. On the 25th of December, 1916, I was night watchman for the Jordan Lumber Company. The fire occurred on the morning of the 25th of December, 1916. I left the building in the morning about half-past 7:00. The mill was cleaned and locked up. I carried a key. There were several doors, but only one door unlocked from the outside. The other doors were locked from the inside with hooks, etc. When I left the building on the morning of the 24th, there were some hot ashes in the stove, but no coals to speak of. There was a rule, no smoking allowed in the place.

(Testimony of William Werner.)

Cross-examination.

(By Mr. LOGAN.)

The mill was burned down when I got there at three o'clock on the morning of the fire.

(Witness excused.) [33]

Testimony of Clarence L. McKee, for Plaintiff.

CLARENCE L. McKEE, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Erickson, and testified as follows:

My name is Clarence L. McKee. I reside at Rexford, Montana. I am the agent of the Great Northern Railway Company at Rexford. On the 25th of December, 1916, I was employed as telegraph at Columbia Falls, for the same company. I remember the occasion of the burning of the A. L. Jordan & Company mill. I first observed the fire about 12:10 or 12:15 A. M. When I first saw it, the fire was already coming out of the roof. There was a small amount of fire in the lower part of the building, but more at the top. There wasn't much burning on the floor. It looked more like burning embers on the floor that had fallen. The mill is located practically opposite the station, across the main line. That would be north of the depot. I could not give you the train movements through Columbia Falls before the fire. It was a cold night. Wind from the northeast. There were three of us in the depot. I cannot say as to loafers, as we are bothered more or less by them, but I couldn't say as to that night. We have ejected loafers there on several occasions. The mill

(Testimony of Clarence L. McKee.)

was about a mile from town. There were no other buildings around except the depot and water tank and this saw mill, except that Mr. Jordan had a cottage and, I believe, a small hotel, managed by Mrs. Siders.

Witness excused. [34]

Testimony of H. D. Ernest, for Plaintiff.

H. D. ERNEST, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Erickson, and testified as follows:

My name in full is H. D. Ernest. I reside at Columbia Falls, Montana. I have resided there since December 19, 1916. I am agent for the Great Northern Railway Company. Was agent on the night of December 25, 1916. I remember the fire of the A. L. Jordan Lumber Company Mill. It occurred about 12:20 A. M. I was in bed. I was called and when I got up I went to the depot as soon as I could. As to train movements, No. 2 arrived there at 8:25, and 2d–27 at 10:25, and the Kalispell Dinky at 10:25, and No. 3, at 11:20. No. 28 reported in there about 12:40. When I arrived at the depot, as far as I could see, the roof of the building was afire. The ground and the roof of the mill was covered with snow. The wind was blowing about thirty-five miles an hour.

Witness excused. [35]

Testimony of Miss Olive Olson, for Plaintiff.

Miss OLIVE OLSON, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Erickson and testified as follows:

My name is Miss Olive Olson. I reside at Columbia Falls, about one hundred and ten feet from the A. L. Jordan mill. I kept house there. I used electric lights from the lighting system at the mill. I used the power there for ironing. Tried to but it was a failure, when the planer was in operation. It didn't give sufficient heat to heat the iron; and when it wasn't in operation my iron would burn up the clothing and burn up the asbestos pad underneath the iron. It would take only a few minutes for the iron to heat after the planer stopped. I do not believe it would take a minute. We lived there from September and left in February and I experienced this difficulty all the time I lived there. When the power was used for driving the machinery in the mill the lights were dim, and when the power was shut off it had the opposite effect. I was at home the day of the 24th of December. I did not notice anyone around the mill that day. Did not notice any smoke coming out of the chimneys. Had no occasion to go to the mill that day. I remember the fire. This Philips, *w*rapped at the door with a shovel and he was excited and waked us up and when I saw the fire, the flames were all flashing towards our house, and there was no lights to dress by. When I saw the fire the roof was burning.

(Testimony of Miss Olive Olson.)

Cross-examination.

(By Mr. LOGAN.)

The boy woke us up about 12:00 o'clock. I live in one of the little cottages shown on the map. It is west of the mill. There were windows on the side that faced the mill. **[36]** When I woke up I saw the flames of this fire. The light was intense. I occupied the house nearest the mill. There were windows on the side that faced the mill. I didn't notice the clock until I got to the station but it was about 1:30 when we got back home. When I looked out the whole roof of the mill was afire. I couldn't see the rest of the mill for the flames up above. The flames were all on the roof and just sweeping over towards our house and that burning involved all this side of the mill at the time when I looked out of my window here. When I looked out of my window, this whole west side of the mill was in flames.

Redirect Examination.

(By Mr. ERICKSON.)

Q. When I said that the entire west side of the building was in flames, I meant the roof. The roof, and the flames was sweeping over towards our house. I didn't say the whole building, I said the roof. The entire roof from one end of the building to the other was afire. When I would turn on the circuit to start my electric iron I would get a shock. We got a shock several times. It was quite a shock but didn't knock me down. We got shocks from turning on the globes or turning my iron on and taking the globe off and putting the iron on. When I would take

(Testimony of Miss Olive Olson.)
hold of the globe I would get a shock and when I would put on the iron I would have to take off the globe. I mean the lamp of course.

Witness excused. [37]

Testimony of Jacob Neitzling, for Plaintiff.

JACOB NEITZLING, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Erickson and testified as follows:

My name is Jacob Neitzling. I live at Columbia Falls. I am town marshal. I remember the fire at the A. L. Jordan Lumber Company mill. It was Christmas morning, some time after 12:00 o'clock. The alarm was turned in to the fire company. They responded and got out but were a long time getting out. I had charge. The nightman turned in the alarm. He turned in the alarm and I also got the bus team to haul the rig up there. It is a chemical rig on two wheels, and it was a long time getting there. It was snowing and windy. When we got to the fire the chemical was frozen up and we couldn't use it. We got to the fire between 12:30 and 12:45. It was all afire when we got there, the whole building. I saw Mr. Jordan there. He had a hose there. Using one of the hose. He was using it on the dry-shed. He was standing between the buildings and the transformers.

Witness excused. [38]

Testimony of Fred Utter, for Plaintiff.

FRED UTTER, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. McDonald, and testified as follows:

My name is Fred Utter. I reside at 114 South Hoye Street, Helena. I am an electrician and have been working at the business for twenty-three years. Have been journeyman and straw boss and superintendent. I have done it all. I am slightly familiar with the premises of the Jordan Lumber Company in Columbia Falls, Montana. I had occasion to visit these premises a short time after the month of December, 1916. I made an examination, at that time, of the electrical wiring which had formerly led into the mill, particularly the lightning arresters. I saw that they were in a blistered condition. The test was made in Mr. Jordan's office. Mr. Stiles was there, and several others I do not remember.

Q. Exhibit No. 5. Do you know what that is?

A. It is a lightning-arrester. I think I took this down off the poles once. It looks something like that. Not just exactly like it. The lining of the box was damaged at that time. I think it was the same box because it was torn down across the top. The lightning-arrester is in a different condition now than it was at that time, if it is the same one. At that time you could slip a sheet of paper between the two coils. I do not know whether you could now or not. I assisted in making the test; used a two thousand volt transformer and stepped it up to two thou-

(Testimony of Fred Utter.)

sand volts. I forget just what the capacity was but it was about a 1-kilowatt transformer and we put this primarily in series with the lightning-arrester, and it sparked across from the top terminal down to the bottom. It wouldn't spark all the **[39]** way down these air gaps but it would go thru this high resistance ground here. The voltage of the primary to which this lightning-arrester was attached is approximately supposed to be about two thousand volts. Judging from my experiment with the lightning-arrester, the effect would be to create a high resistance ground on the system. I think that that ground would be in operation constantly. If the lightning-arrester were working properly, it would not be a constant ground, only when there was an overcharge, like lightning, and it might take care of high transmission, such as 13,000 volts such as they have at that time. It should discharge to the ground and then break the arc. That is the purpose of it. The resistance of the lightning-arrester should be considerable more than two thousand volts on a two thousand volt line. That is about a six thousand volt arrester, I should judge. I made an examination of the transformer on that system. It was not grounded on the secondary at that time. The ground prevents fire hazard and it would also be a great safety factor of life in connection with the circuit if there was an overcharge of electricity on there. Assuming that the secondary was carrying a voltage in the neighborhood of one hundred Ten volts, the secondary should have been grounded, and

(Testimony of Fred Utter.)

if it were not grounded, and with this lightning-arrester in the condition it was, there would be an additional hazard, from this defective lightning-arrester. The lightning-arrester would offer a high resistance ground,—that is on the one side of the primary line. The current would naturally take the least course of resistance. If there was a proper ground there would be no chance for an arc because it would go right to the ground.

Q. Will you explain to the Court, Mr. Utter, just about this charge of current in the primary, with this defective lightning-arrester, [40] and no ground on the secondary,—how it might go to ground thru the secondary?

A. All that would be necessary would be for there to be a ground,—there would be a bare place or something of that kind or a weak place where it would get to ground on the opposite side, and I should say it would be pretty near necessary for there to be a defect in the transformer, if the system worked before. It might be a ground between the first and second coil or a puncture or slight ground around the edge of the transformer, or a connection between the primary and the secondary at the transformer, that would cause the ground or a sustained arc through the primary. It is liable to cause an excessive current. It would probably run into some of the wiring and finding a weak spot some place—and create a fire hazard under the conditions of a high resistance ground.

I looked at the transformer. I do not just remem-

(Testimony of Fred Utter.)

ber its condition. The porcelain was broken on one of the transformers. One of them had been afire around the transformer and the insulation was somewhat carbonized on the outside. A carbonized insulator might offer a path of conductivity to an electric current under a very high-potential. I do not believe that the carbon would cause a short under two thousand volts. I noticed that one of the coils had been afire.

Q. Mr. Utter, suppose this state of facts to exist; On or about the 25th day of December, 1915, a mill of the plaintiff was burned; that night the weather was very cold; a strong wind was blowing from the northeast; the mill was located directly north of the tracks of the Great Northern Railway line, past which trains were going; there was about two feet of snow on the ground and snow on the roof of the mill; the floor in **[41]** the mill and the machines in the mill were clean; the switch was out on the power circuit and was closing on the lighting circuit; there had been no fire of any kind in the mill for some seventeen hours. The buildings were locked and there was no one on the inside of the building and had not been for some nine or ten hours; the mill was supplied by a power and lighting circuit from a transformer which was about forty-eight feet away from the mill. The secondary on the transformer was not grounded; the lightning-arrester was in the condition in which you have described it. From the primary there was coming a current with a voltage of about twenty-two thousand volts. The interior wiring

(Testimony of Fred Utter.)

was in steel conduits and inside the steel conduits there was insulated wire. Also there had been observed immediately previous this condition: that an electric iron attached to the lighting system in question would become red hot in a matter of seconds or probably less than a minute. The lights were burning out. What would you say as to the probable cause of the fire in the mill?

A. Well, I would believe very firmly that there was a break down in the system some place that caused an arc.

Mr. McDONALD.—You may take the witness.

Cross-examination.

(By Mr. LOGAN.)

Q. Now, Mr. Utter, with reference to this last question: We will assume that I have repeated all of the question propounded by Mr. McDonald, with the exception of that statement of his that no one had been in the building for twelve hours, and substituted in lieu of that portion of the question, these facts: That it was a sawmill and the doors were locked, and no one knew whether the windows could be opened easily or not, and [42] assuming that it was possible—it was alongside of the railroad track and it was possible for tramps to get into the building without the knowledge of the owner, during that storm, and possibly they started a fire in the stove or otherwise. Now, Mr. Utter, would you say from that state of facts that the fire was probably electrical or probably started from some other cause?

A. Well, if there is evidence that there was any-

(Testimony of Fred Utter.)

body in the building, I would think it might be started some other way, but the conditions were exactly right for a fire there. I assume from Mr. McDonald's question, if those are the facts, that every probable cause for a fire has been excluded except electricity or an electrical fire and I took into consideration his statement that nobody had been in the mill for some twelve hours prior to the fire. If, on the contrary, it was possible for anybody to have been in there, I still feel as tho that mill was set afire by electricity and you would have to show me that it was not. I got his opinion from the question on the lightning-arrester, and I am basing my answer entirely on that. If, as counsel for plaintiff say, the mill was kept perfectly clean and all wires were in conduits, there is dozens of places in a mill that a fire could start, and if it started that way, it would be all over the mill so quick you couldn't tell where it had started, and the effect would be, upon the interior wiring, to burn it up, which would take about thirty seconds. It was a high frequency current and there was no ground outside at the transformer. There was resistance in this ground. Excessive current is more apt to go by a fuse than a subnormal current. I could not say what the voltage of the lightning-arresters are. They are in the vicinity of six thousand volt arresters.

The spotting on those cylinders is caused by an arc. I do not **[43]** think it was caused by a leakage from the transmission line thru the lightning-arrester to the ground but by lightning. That light-

(Testimony of Fred Utter.)

ning stroke partially grounded the arrester. I do not mean that it was placed in a condition where it refused to carry. It was placed in a condition where it leaked, that is, carries the current to the ground when it should not. This condition might decrease the flow of the current on the wires. It would tend to intermittently decrease the flow of electricity between the lightning-arrester and the transformer. I don't think it would bother the transformer working as long as there was no other ground on the other side. That leakage in the lightning-arrester might cause an excessive current to pass thru the transformer or by it—for instance, part of the secondary might have been out of commission because of the ratio of increase.

Mr. GROSSCUP.—Q. These lightning-arresters are in the twenty-two or three hundred volt line, are they not?

A. Yes, sir. A distance of about two hundred feet before the transformer was reached.

Q. Now, then, what would have been the effect on the current as it entered the transformer on the high side, if you had taken this lightning-arrester out altogether? A. It would have been normal.

Q. In other words, it would have been the same as it entered the transformer as it would have been on the line before it reached the place where the lightning-arrester was?

It should have been; yes.

This leak in the lightning-arrester decreases intermittently the quantity of current on the side of the

(Testimony of Fred Utter.)

lightning-arrester towards the transformer.

Supposing you take off one-third of the depreciation of [44] the *this* lightning-arrester, it would depreciate one-third the current on that line. The voltage could be increased on the wire between the lightning-arrester and the transformer by reason of the defective condition of this transformer. I do not mean that the lightning-arrester would have the effect of becoming a transformer and raising the voltage.

Q. Now, then, you are passing the current over your main line, over this twenty-three hundred volt line? A. Yes.

Q. Would that exceed twenty-three hundred volts under any circumstances, at any point between the lightning-arrester and the transformer?

A. Not unless it was boosted.

Q. Now, this defect in the lightning-arrester would not have the effect of boosting it?

A. It would cause surges on that line.

A. How?

A. It would deteriorate the operation of the secondary winding, which was bound to occur from using that.

Q. That it would deteriorate the transformer?

A. Yes.

Q. And would boost the voltage on the line?

A. I did not say that.

Q. But that is what I am asking you. Under no circumstances would it boost the voltage on the line, beyond the transformer?

(Testimony of Fred Utter.)

A. No one said that. You understand my answer?

Q. I understand your answer that it might disturb the transformer.

A. It might disturb the transformer and might cause it to be intermittently increased.

Mr. GROSSCUP.—That is all. **[45]**

Redirect Examination.

(By Mr. McDONALD.)

I think the resistance on that transformer would be very nearly a zero ground under normal conditions. If the source of the power was boosted at the power plant it would be very near a high resistance. As to whether the voltage in the primary should become higher than the lightning-arrester would resist, there necessarily would be any current flowing thru that lightning-arrester which would then become grounded, depends greatly on other conditions, and the other conditions would then have to be present before any current of high voltage to flow the secondary, was that it might be grounded on the opposite side. It might have been an accidental occurrence or might have been a hundred different ways. If it were grounded, nearly two thousand volts would then be flowing thru the secondary. That is the same current that would be coming thru the primary wire.

Mr. McDONALD.—Q. You may explain the business of the transformer.

A. It is to reduce the current to a certain ratio; it might be 440 or 220 or 110 volts, just what is required. This is done by the ratio of turns. If wind-

(Testimony of Fred Utter.)

ing were twenty in the primary and ten in the secondary and, assuming there is no waste in heat, the ratio would be five to one. They are generally wound at the ratio of ten to one. **[46]**

Testimony of Charles H. Stiles, for Plaintiff.

CHARLES H. STILES, a witness called on behalf of the plaintiff, having been first duly sworn was examined in chief by Mr. Erickson, and testified as follows:

My full name is Charles H. Stiles. I live at Columbia Falls. My occupation—planerman. I have been employed by Mt. A. L. Jordan Lumber Company for five years the 7th of March. I was not in its employ on the 25th of December, 1916. I was in St. Paul. I returned on New Year's morning.

My duties are to keep all the machinery up in shape and look after the tools, and the last two years it was my duty to look after all the lighting and power system and make all reports.

The lightning-arresters I should judge were close on to two hundred feet from the transformers. I made an examination of those lightning-arresters, after I returned from St. Paul. Mr. Utter was with me. We opened the box and found one of them in a crippled condition. I would say that one of them had been struck by lightning. The others looked to be in good shape. There were three of them. The lightning-arrester is composed of cylinders with air gaps in between them and there had at some time been a current over that to melt the brass cylinders, so

(Testimony of Charles H. Stiles.)

that they would touch in places.

Q. Now, then, mark this Exhibit 5.

(Document marked by the reporter.)

Q. You may look at Exhibit 5 and state what it is, if you know. (Handing to witness.)

It is a lightning-arrester. I could not swear that it was the one I examined, it is possible that it is the one on account of the pitted condition of the cylinders; it is not in the same condition as when I examined it, for the simple reason that this is the top of the box and the lightning-arrester that I examined at the time, the [47] first two cylinders were in contact. They showed signs—the lightning-arrester had been suddenly dropped and jammed, the first cylinder into the second one.

Mr. ERICKSON.—(To Counsel.) Have you any more?

Mr. LOGAN.—Yes, sir, we have five of them. Two of these lightning-arresters are from the Soldiers' Home at Columbia Falls. We have brought them all. We don't know which is which, but you can pick out any three of them you choose, and call them the ones from the Jordan Mill. That is all we can tell you.

Mr. ERICKSON.—Q. Mr. Stiles, will you look at these three and see if you can identify all, or any of these others as the ones you have tested and examined?

A. I am not positive. The one the way I had it in mind now, and I am quite clear in my mind, it seemed to be in a worse condition than this one and this seems

(Testimony of Charles H. Stiles.)

to be the worst one we have here. It seems that the first cylinder and the second one—that is the whole block had been dropped and the first cylinder had been suddenly jammed close to the second one and from there on they were equally spaced all right, but this box here shows a cylinder that is almost perfect. This cylinder here (indicating), as well as I can remember, was suddenly dropped so that it had struck the floor or some other object, and was suddenly jammed against this one so that there was no air gap between them. The third cylinder indicated that lightning had gone through it to ground. To test the lightning-arrester, we used a small transformer and put it in connection with the line on both ends, stepping 110 volts to 2,000 volts and she skipped thru and continued to work—continued to circuit. That indicated that the lightning-arrester was in bad condition. I connected the arrester to the secondary and off onto their transformer system. When it was in place, it was connected with the primary. The purpose of the arrester [48] is to take the excessive voltage to the ground. It does not necessarily have to be lightning. Any excess voltage is not liable to go to ground that way. It is more a sudden jar or runaway of the machine that would cause it. The amount of current was in the primary wire at the mill was twenty-two hundred volts. It would step down from 2200 volts to 110 and 220. We had trouble for a considerable length of time keeping the lamps going, and also fuses. The lamps were real short-lived and lasted but a very short time. At different times they

(Testimony of Charles H. Stiles.)

would get lamps from the company and some would be 110 volts, and maybe the next would be 118, and we finally got up to 122 volts at last.

Cross-examination.

(By Mr. LOGAN.)

I have been connected with Jordan Lumber Company five years. Preceding the time that I had anything to do with the installation or anything to do with the mill, the underwriters had made several inspections and I think it was the third or fourth that Mr. Jordan had received after I went to work, that he handed one of them over to me and wanted to know if I could do the work. I said that I would do the work under Mr. Mills' supervision. Mr. Mills was the electrician for the insurance underwriters. He had no connection with the Northern Idaho & Montana Power company, and as I didn't claim to be an expert electrician and wasn't taking the whole responsibility on my own shoulders, and as far as the work that I had done, it was reported satisfactory to the Board of underwriters. I had done some work. One of the first positions or pieces of work I had done was on power work. The fuse condition was in bad shape. The motors had, before my time, been changed to other and larger sizes, and the cables left to the size of the motors that were originally in there. That is, one of the duties I had to do, to take out the old cables and put [49] in other cables that would supply the motors that were installed at that time. These fuses were in bad condition. The main fuses were cartridge and knife-blade fuses. I took those

(Testimony of Charles H. Stiles.)

fuses out and ordered fuse wire according to the rating of the underwriters. That is, fuse wire that was tested, and renewed all the fuses and put them into service in their respective places. Well, I handed Mr. Jordan the order for new wire. I don't know where he ordered it.

At that time there were fuse blocks on the top of every compensator, or starting-box, that were on the walls and not protected in any way. The recommendation Mr. Mills gave men was to have cabinets made, using Federal bushings for the entrance and outlet of the wires leading to and from these respective fuse blocks. That was done on, I think, four large motors. The others were, I think, self-contained switches. I received my salary from Mr. Jordan. I went at that work at odd times under Mr. Jordan's instructions, with the supervision of Mr. Mills, afterwards.

The lighting system originally was 220 system, taken off of the main cabinet, the same as the power system. This system was made on the ceiling and rafters with an open knob and cleat work, using rosettes and common cord and sockets to complete the work. Mr. Mills condemned the whole system, and told me to take it out at an early date or in just so many words. I did so, and as I had time I went on putting this work in. I put this system in in conduit, and in fact, all the work was put in in conduit. The job wasn't completed at that time. In fact, I replaced all the old wiring that was used for lighting purposes there and put in conduit work throughout

(Testimony of Charles H. Stiles.)

the building. I did that as an employee of the Jordan Lumber Company, and under the instructions of the Jordan Lumber Company, at the advice of Mr. Mills, of the underwriters.

If it was 123 volts, I am mistaken. I testified that it was [50] 110 volts but I didn't say I was sure of it. When I changed these lamps, the largest lamp that I put in was one hundred twenty-two, that is the highest I have any recollection of. I have seen them go,—that is, some of them would not last a bit longer than some of the lower voltage lamps, and others of the 120 volts would continue to burn. There is some there from the time I went to work there, and were there at the time I left for the east; those lamps were inside the mill. I went some time in December, 1916, about ten days prior to the fire.

I put in drop-lights when I ran this conduit system around, and ran it up through these outlets. They were practically all new sockets. I do not know where they came from. I wired them up, or it was under my supervision.

Q. Now, suppose you had a two thousand volt lighting-arrester and you connected it up with a 23-horse power line, or two thousand volts, to make it exact, and connected both your terminals with a current that had been stepped down to two thousand volts, and it passed through your lightning-arrester; would you say that that lightning-arrester was then performing its function, if the current passed through?

A. It would under one condition.

Q. What is that?

(Testimony of Charles H. Stiles.)

A. If the secondary was grounded with the neutral wire—she would be doing her duty if the transformer suddenly broke down. I made a test of one of these arresters. I could not swear as to which one. It was shortly after the fire. I took this lightning-arrester down off the pole. I took it over to Mr. Jordan's office. I connected it up with the lighting system. The lighting line came from the transformer on the outside, on a pole. The office is almost due south of the mill, and the old depot that stood there at that time. I should judge it was probably four hundred and [51] fifty or five hundred feet south of the mill. That transformer wasn't any of the transformers in question. That is none of the transformers that were around the mill at the time of the fire.

I do not know what voltage I was getting through the transformer at the time I tested the lighting-arrester. More than that the transformer was marked with a ratio 2200 down to 110 and 220 volts, and if they had 110 on the primary they had 2200 on the secondary.

I stepped it up to 2200. I put through one of these boxes here 2,000 volts and she passed through, skipping as she went through from one of the cylinders to the other. I took it for granted that it was a two thousand volt lightning-arrester on that service. I am not expert enough to say whether you can safely run 2,000 volts through a one thousand arrester. My judgment is that if it will carry the load through the lightning-arrester, and that the cylinders I cannot say that the purpose is to get your excessive

(Testimony of Charles H. Stiles.)

voltage through the lightning-arrester, to ground or when the current does pass through it shows that it is performing its functions. When you apply that condition to these cylinders, it doesn't indicate that the lightning-arrester has been performng its functions and that it is carrying the current through when there has been an excessive current from lightning or otherwise. I would say that it has been hit some time with lightning and undoubtedly had performed its duty, but being left in the condition it was when I found it, I was sure that it would not perform its duty again. I saw that there had been a charge through the lightning-arrester, and that the cylinders were melted and pitted, and in a smokey condition. It led me to believe that a certain amount of current would be going through to ground at any or all time. I would say that it was hindering the service on the line. In other words, I mean that the power was not equal with these performers. You might get and probably did get 2,200 volts to the transformer at times. It [52] would be a load that would be up and down.

The lightning-arresters were between the substation at Kalispell and the transformer. And the transformers were between the lightning-arrester and the buildings. [53]

Testimony of William L. Kimmel, for Plaintiff.

WILLIAM L. KIMMEL, a witness appearing on behalf of the plaintiff, having been first duly sworn, was examined in chief by Mr. Smith, and testified as follows:

(Testimony of William L. Kimmel.)

My name is William L. Kimmel. I reside at Spokane. Am forty-three years old. Am an electrical engineer and contractor. I graduated from Ann Arbor. Took degree in electrical engineering.

I have been installing and operating electrical plants both for ourselves,—I am in business with Mr. Nixon in Spokane, and we have been operating lighting plants for ourselves and installing them for others since the fall of 1899. I was in business for myself alone or with another partner part of the time, from 1899 to 1903 and installed the plant at Grangeville, Idaho, and operated that and sold it out in 1902, and then sold out and went in business with Mr. Nixon, and we installed the Rathburn plant for ourselves, and I think we operated that for about three years.

I have been in Columbia Falls. I never saw this Lumber Plant before it was burned. I was there in February, I believe. In 1916, if I remember rightly. That was after the fire and they hadn't cleaned up around there yet. I looked the situation over at the time and the lightning-arresters were located on a pole, west of where the transformers were located. I didn't see any transformer at that time. I saw this transformer that you speak of, I think just a few days ago, in the warehouse of the Power Company, Mr. McDonald, the General Manager was there. He said it was one of the transformers at the mill.

Q. Mr. Kimmel, I wish you would tell the Court what the function of one of these lightning-arresters is and take one of them and explain it briefly.

A. It is a piece of electrical apparatus to lead off

(Testimony of William L. Kimmel.)

lightning charges to ground, from the system. Or any other overcharge [54] or excessive voltage, and especially lightning. It is what is known as lightning protection. Immediately after the lightning charge has been led off to ground, the function of this arrester is to disrupt the arc and return the line to its normal condition. That is about all. They can be used over and over again. They should be looked after and I should say that their resistance should be examined to see that their quality wasn't destroyed and also the air gaps should be looked after. The air-gaps is the space between the brass cylinders. From my experience I should say these lightning-arresters *out* to be inspected, say, once a year any way and, if there are frequent thunderstorms probably oftener. In case of a violent storm of lightning they probably should be inspected but I don't believe we ever did it in our own case. These discolorations here (witness examines Exhibit #5) indicates that there has been quite a discharge thru the arrester. It might have been lightning or some other source of high potential. Assuming that there has been a discharge an arc would be set up between the cylinders and would cause the burning of—by arc I mean that a current passing thru a vapour or metal or carbon. In this case it would be a vapour or metal and it would jump across from there. That is a current of electricity. The effect of such a current, when bringing about an arc, upon anything that is easily ignited, would be to set it afire. I do not know the intensity of the heat of the arc but believe

(Testimony of William L. Kimmel.)

it is somewhere around three hundred or four hundred degrees. I believe the charred and pitted condition you find in Exhibit #5 on those cylinders was caused either by a lightning discharge going thru there, or a discharge from something else. As it now is, I believe that lightning-arrester will work all right, that is, it would probably perform its functions. Of course we cannot look into the inside [55] of these carbons, but I think that it would carry the current around and not interrupt the flow of the current. I cannot say that that particular lightning-arrester would leak much current in the condition it is in. It might. Assuming that Exhibit No. 5 is the one that was on that pole it was in the power company's office three or four days ago, and it was then in the same condition it is in now. I didn't climb up the pole to look at it, when it was at the plant of the Jordan Lumber Company. Supposing that these two top coils at one time were so close together that you could not put a sheet of fine paper between them, the effect upon the efficiency of the apparatus, so far as the lightning-arrester would go, that would take the lower discharge to ground, if the lightning struck the line, and it wouldn't have so far to jump. If it were in such a condition that it lacked the proper air space or air-gap to keep the line voltage from going to ground and the other side were grounded, of course, it would go to ground there and cause a short circuit. A dead short circuit would open up the post circuit or pole and pass or open up a circuit-breaker, and of course, if you had the right conditions for that, where

(Testimony of William L. Kimmel.)

that circuit was conducted, why you would get an arc. A dead short would be where two wires of opposite polarity connected directly together, or were touching each other, and remained in touch. In such case if the circuit-breaker or fuse would not blow out, of course, if the wires were too small to carry the current, they would get hot. The degree of heat would depend on how much current there was in the circuit. We have other shorts such as swinging shorts, or partial shorts, or leakages, which would result in a short. But dead short means continuous contact of two wires or conductors of opposite polarity. When I say that ground won't pass, I mean that if we had a ground on one primary wire, say a 2,200 volt wire, or 2,000 volt line, there is always a tendency for the other side to go to ground, and if [56] you had any weak point in the system it always tends to go to ground through that point. We speak of grounding as it might to go ground or it might to go ground on the frame of the transformer. It might go to earth all right, or maybe be grounded on the frame of the transformer or if it is a dynamo, on the frame of the dynamo, or on any other place that is a good conductor.

A transformer is an electrical devise made for changing from one electrical pressure to another. Either stepping it down—stepping down the voltage or stepping it up, as the case may be. I have a little diagram along here I can use. I don't mean (here witness produces document marked 6) to say that it has the appearance of a transformer, but it repre-

(Testimony of William L. Kimmel.)

sents the theory of it. From that point of view it is substantially correct. I have drawn a circle here representing the iron core of or magnetic part of the transformer, and also a square, circumscribing that and a circle representing the case, and a wire leading in and wiring around that core, and out again. That was made to represent the primary wiring. On the other side I have drawn the wire leading in and running around two turns and out again, and back into the case again, and around two more turns, and out again. I didn't pay any attention, when I drew this, to the ratio of turns in winding these and that is a very particular point.

This tap off here is what we would call a neutral wire. This diagram is for a single phase transformer. In actual practice these wires are put on next to the core, and this wire around in on top of this, and then of course, there is always the insulation between the winding and the core to prevent electrical contact between the winding and the core, or to prevent that from grounding on the core. To reduce it, this primary wire winding comes in here. That brings in the energy in case this was a step-down transformer. [57] The current comes in here and passes around this winding and sets up a magnetic induction in that iron ring which throws the magnetic flow around, in first one direction and then in the other direction. In our commerical frequency of 60-cycles, that is 60 times a second.

In this winding there would be induced an electrical motive force from that which provided an elec-

(Testimony of William L. Kimmel.)

tric pressure across these terminals, and when you connect that up to a device that consumes current like a lamp or motor, the current will flow in that circuit. The neutral wire is a tap off from the central point of this transformer. The center of the secondary wire, and by using that neutral wire and one outside wire, you have one-half the voltage across here. I couldn't exactly tell you why that is called a neutral wire. It does not neutralize any force but it has been known as a neutral wire ever since I can remember. It came down from the old Edison System where we had two wires together, and with a wire which was cut to both machines, we had the neutral wire. This wire is all insulated from the core.

The COURT.—Well, how does your electricity get out of this wire?

WITNESS.—Well, that comes in the nature of the magnetic flux, travelling back and forth through the magnetic circuit, and threading through those coils. I believe I could make you understand that better by going back to Feredith's discovery. A magnet moved in proximity to a circuit which was carrying current. At that time they had only the current made from galvanic batteried, and Feredith took a coil like that,—wire through which there was a current flowing, and accidentally happened to pass a compass along there, and he noticed at once that the magnet immediately *whippes* around. He thought about that of course and reported it to the Royal Society, and a little later he happened to think that it might be true that if he would move a magnet in

(Testimony of William L. Kimmel.)

front of the coil, it would set up a current [58] in the coil, and he found that that was the case, and so that led to the dynamo of to-day. And while there is no movement here of any magnet in front of a coil of wire, there is a magnetic motive force or flow in that iron, through those coils, and that varies from zero and up to maximum and down again, and that takes place sixty times a second, and sets up an electrode motive force there, and when you apply a load to that that will allow a current to flow here by demagnetizing the iron. I should say that this neutral wire ought to be grounded in every case. I can explain that very easily here.

On your 2200 volt side, in case you get an accidental ground and the connection between your primary and the other side of the primary and the secondary, you will then have between your secondary wiring, at all points, approximately the primary voltage. If you were to step up to turn on a light in the basement you are in grave danger. I always refuse to work in secondary work unless it is grounded. If you have a bank of transformers connected up as you have in a 3-phase circuit, it would not be possible to ground all of them, and the highest possible voltage you could get there between any points of the circuit and the ground, in case of a 220 volt, would be around 200 volts. But in a case like this where you have a 220 volt primary and a 110 secondary—I will put a ground on one of these primaries up here. Now, if you will observe, you have a ground on this primary. No connection between this ground and

(Testimony of William L. Kimmel.)

this wiring, and I stand here on the ground and touch one of these wires. We will say that I touch the lamp or socket, which is indicated with this wire here, and I would then get a voltage between the ground and that lamp of 110 volts, because this point is only 110 volts difference in potential, between that wire.

Now, in case of any accidental puncture between your transformer [59] or any connection between them,—between your primary and your secondary wire, it would put two thousand volts on this line, and if I stood there without this ground on there it is impossible to get more than what it is here.

Supposing this transformer is at the top of the pole. The wire would consist of the wire attached to the neutral on the secondary side, running down the pole. A metallic connection between the neutral or a ground pole. I would use rather a water system where we had metal or iron pipes, to make a good conductor.

To the ordinary observer it would just simply be a bare wire from the transformer to the ground, and connected to the neutral point, or if the transformer were connected up for 110 volts instead of 110 or 220, we would put it on one side of the secondary. It amounts to the same thing. From my experience in taking the illustration I have just given, I would say a failure to ground this neutral wire indicated that the installation of the transformer was very bad construction.

Mr. SMITH.—I offer Exhibit 6 in evidence. You used the word "puncture" a moment ago. What did

(Testimony of William L. Kimmel.)

you mean by a puncture in the transformer?

A. I meant by that a breakdown in the insulation, between the primary and the secondary or between the primary lead wire in the case, and back again to the lead wire in the secondary.

Q. Well, I will have to ask you for another explanation. What do you mean by a breakdown?

A. A breakdown in the transformer would be a case where the insulation had failed to hold and perform its functions.

As to how these coils and wires in this transformer themselves are insulated—the core is insulated with the usual transformer insulating material, and then the section of the secondary is wound around on there and then there is another layer put on that. [60] as Empire cloth, and I presume there is Mica cloth and Miconite,—I cannot tell you what they used in this case. Oiled cloth is commonly used and known as Empire cloth, and I presume there is Mica cloth in this also, but I am not certain. It is wound around over the secondary and then another section went over, and then this is insulated again, and then the iron is pulled up around that, and the cases are filled with oil. This square that I have indicated here is supposed to be the case. The oil is poured around these spaces so that the wires are all covered. You understand that this is simply a diagram and not a picture. But the final insulation consists in covering the entire thing over with oil. In this particular transformer, I believe there must have been about fifteen or twenty gallons of oil. I have never

(Testimony of William L. Kimmel.)

known any cause or case in my experience where the oil didn't last the life of a transformer. They occasionally put in more oil. I have seen some old second-hand transformers that have had oil in them where the compound got very thick. I have seen breakdowns in transformers that have had oil in them, and so, I should say it is possible to form a puncture through the medium of this oil.

Q. I wish you would tell the Court how a breakdown in a transformer that is entirely enclosed in a steel jacket or case can occur.

A. Between the primary and the secondary winding the insulation, I should say, in this transformer is possibly about a quarter of an inch thick. It might be a little thicker or thinner, but wherever a weak spot occurs or any other cause, and really there would have to be no excessive lead in mind, if there was a weak spot in the insulation, and the potentials were brought about, there would be a breakdown wherever that insulation was not of [61] sufficient strength to stand it. It would seek the first weak spot it could encounter. As to what might cause that condition—a stroke of lightning, which was not let off by the lightning-arrester, might cause it or it might be due to a defect in the transformer in the first place.

Q. We will eliminate that last proposition because here is a transformer that had been there quite awhile. Are you able to judge—from the testimony you have heard here and in the light of your own experience, and form an opinion as to what happened in that transformer?

(Testimony of William L. Kimmel.)

A. I have a very definite opinion as to what happened there but I don't believe I could tell you why it would happen. I am firmly of the opinion that there was a connection between the primary and the secondary winding.

Q. I will ask you to take into consideration all of the testimony you have heard in this case, assuming that you have heard it all,—and I think you have,—and tell us if you are able to your own satisfaction to form an opinion as to what caused that fire?

A. Yes, sir, I am. An electric arc in the mill is my opinion of that.

Q. Do you recall the testimony to that effect that the transformer itself was burning on the inside?

A. Yes.

Q. What importance do you attach to that, if any?

A. Well, that in my mind would lead me to believe that there was a connection between the primary and the secondary in that transformer and undoubtedly that there was an arc in the transformer and that it was in the same circuit as the other arc was.

Q. How would that set that other fire?

A. Wherever that went to ground to complete the circuit. [62]

Q. And what condition did you find to show where it might have gone to ground?

A. Where?

Q. In the mill?

A. Well, the mill burned up and I couldn't find any conditions there. I didn't see it at the time and I assumed that the mill that he had there before was

(Testimony of William L. Kimmel.)

somewhat similar to the one that he has at the present time and I have looked that over.

Q. Taking the description of that mill as you have heard it here, together with the wiring, insulated by means of metal pipe running along the joists and to the various motors and light sockets, etc., how does it come out, and what sets the mill afire?

A. The connection between the primary and secondary with a 2,000 volt circuit, would, of course, scattered throughout that mill. I believe it would be in the *in the* conduits and in the boxes and the space between the cut-outs, wherever that wire went in, whether in the lightning circuit or the power circuit, and they are never built to stand 2,200 volts or anything near that amount. I should say that somewhere between 1,500 and 2,000 volts got into the mill. Assuming that the lightning-arrester had caused the ground, I should not say that all of the primary current went in but it might have all went in. It depends on whether the lightning-arrester was a dead connection to earth. This matter of electricity is something that a man of my profession even does not understand all the mysterious workings of. We can tell what it will do under certain circumstances but cannot always tell why. Suppose that high voltage current got into the wires instead of the mill, in those metal pipes, it would take three or four seconds to heat one of those pipes so that it would set fire to a roof or joist. Whenever you get one side of your circuit connected up with a 2,000 volt line and the other side grounded, whether those [63] circuits

(Testimony of William L. Kimmel.)

may be insulated for 110 or 220 volts, you are very liable to get all of the conduit connected with that circuit, and at the point the wires are tapped off there are splices made and they are usually crowded in the pipes so that the space is pretty close and the current would very easily jump the gap into the conduit. And then wherever your conduit runs it will go into that so you would have it spread pretty well over the insulation. If the pipe should touch the blower system it would be connected up with that and if the lightning circuit should touch the power circuit you would have it from one circuit to the other, whether the power switch was open or closed. And there would be a great many places, in my estimation, where this current would go to ground and where it did go to ground through a high resistance and you would be sure to get an arc.

Q. Let me ask you: Can you eliminate the fact that the transformer was afire and still form an intelligent opinion about this fire or not?

A. I think so. But I think it would hardly be necessary for this current to set the transformer afire but the fact that it did set it afire strengthens my opinion considerably and that is the point which I think shows that it actually did occur. I mean by that that the conditions would be substantially the same altho there might not be heat enough to set the transformer afire. My judgment is that this circuit that caused the arc and set the fire, was located in the mill.

When you find one ground on a high tension wire,

(Testimony of William L. Kimmel.)

the tendency of the electric current is always to seek a path to close that circuit up, and make a short circuit. That means to seek a second ground. It means a difference of potential between the ground and the other side of the circuit, is lessened, and of course [64] the liability to go to ground is so much greater. If the distance from the other wire to the ground were very great, there would not be much of a tendency. The tendency would be to *to* to ground wherever the other of the circuit was connected, and consequently the tendency would be to go to ground through the weakest point. As it would actually go to ground in some spot, you have got a circuit there, and if there were high resistance in that circuit there would be a good deal of heat produced. If it were an arc that went across it would produce a fire, providing the materials around it were inflammable.

As to whether or not there must have been a ground somewhere between the secondary under consideration in this case, and the place where the power was generated over there. I would say that, as I understand the installation of this transmission line, that the power as generated in Big Fork was stepped down twice before it got to this place. My opinion is that there was a short circuit between one of the 2,000 volt lines that went into the transformer and there.

Q. What makes you think that?

A. Well, the transformer was described to be afire at the same time that the mill was afire, and in addition to that, there were two simultaneous fires. One in the transformer and one in the mill. That, to my

(Testimony of William L. Kimmel.)

notion, would tend to make me believe that an arc through the one caused the fire in the other. An arc through the transformer caused the fire in the mill. As to whether a ground somewhere is constantly to be apprehended and should be guarded against, I will say we always take great pains to keep our lines free from ground. Our primary lines. I think it is true of all operating companies that they try at all times to prevent a ground on primary lines. A limb of a tree, for instance, [65] suddenly touching the line overcomes that ground. It is pretty hard matter to keep the line free from ground at all times. Trees grow up and although you may trim them off, the first thing you know, they are up there again touching the wire. And they are constantly the means of getting ground. A lightning-arrester such as described to have been used in this case, I should say would be another source of an accidental ground. The grounding of the neutral, if there had been a ground on this transformer, would have made the mill safe. The maximum difference of potential you could have *toggen* into the mill with the neutral or that transformer grounded, even considering the power circuit in addition to the lightning circuit, would have been somewhere around 800 volts, possibly a little over that. That would have diminished the probability of a fire considerably, or altogether removed the possibility of a fire. High resistance ground is contact between the wire and the earth through some means that offers a very great resistance or a high resistance to pass. The current may flow through that

(Testimony of William L. Kimmel.)

but not enough of course, to disrupt the fuse or open up the circuit-breaker. I wouldn't say that that is in contradistinction to a mere spark. It may have a discharge if the wire were passing along a tree up there and it was merely touching it you might get a discharge or a little arc between the tree and the wire occasionally, when the wind whipped it around. I wouldn't call that a high resistance ground, but should the tree touch the wire and a branch come in contact with the wire, that would be a high resistance ground and the tree would not necessarily set a fire or burn *or burn* up unless there was some other path for it to get back from the ground to the opposite wire. But when it does get back, then it would set the tree a fire. If there were a high resistance ground in place of this mill and the metal insulation [66] around these pipes was a portion of that high resistance ground, we would see an arc. Unless you had a good metallic ground there. If you had a high resistance ground through the air space or along a broad surface that was adjacent to the pipe in the path between the pipe and the ground you would find your arc would be set up there. The result would be the pipe would get hot. Red hot or white heat. And if it were in connection with wood in places it would have a tendency to cause a fire. The degree to which that would heat under those circumstances is measured by the amount of force that you have got behind it. Although you can get a very high degree of heat out of a short arc. Take our arc lamp for instance and we only have a potential of about sixty

(Testimony of William L. Kimmel.)

volts btween the carbons and they produce a high degree of heat. There is this about an arc formed with a high potential, that it will travel much further and make a much hotter fire and sustains itself as a rule, longer, if the resistance is proper.

When you find the conditions as they have been described to have been in this case, I would expect to find a sustained arc at some point in the plant, wherever the conditions were favorable.

The nearest point to ground would be the point where I should say the arc would take place. However, it might take place between the winding and the conduit at one place and between the conduit and the ground in another place. I have seen a piece of pipe through which carried the current and where the current a—potential was never supposed to be on that circuit that high—where the current put on that circuit burned holes through the pipe about three inches long. Of course it was at white heat while doing so. There was an arc traveled from the wire to the conduit and from the conduit into the ground there.

This pipe that carried these wires is made of about the [67] same material as these ordinary gas-pipe. It is made of mild steel and the conduit as we call it, for electrical work is smooth on the inside and then coated with enamel and gas-pipe. I understand they don't bother to clean it out. In the operation of such a plant as this was, for the generation of electricity for lights and motive power, and such things, there is an expression called "Peak Load." It means the maximum amount of current which a certain con-

(Testimony of William L. Kimmel.)

sumer will use. That is the maximum amount of power that is drawn for any time. Usually we consider about three to five minutes,—that varies and we call it the peak load. When the people in one part of the city cease to use the power for any purpose, the effect upon the lines in use would depend on the design of the system of course. If your gas-pipes or wires are not sufficient and heavy enough to carry the load, without variation when it is on high, you get that variance of pressure. As to when we look for a big load on an electric work, on this kind of a system, I could not say when their peak is. I know in the summer-time if there is a quantity of illumination there it would be late, but their peak would be in the winter-time, but in the summer I should look for the peak around five or six o'clock. The lighting load would perhaps come on earlier in the winter, and in the summer-time the load would be later on. About five or six o'clock in the afternoon. As to peak pressure, as distinguished from peak load, there is always a certain pressure on the system, under certain conditions, but if we have a governor on the water-wheel, it will maintain that pressure. You can take into consideration line lights and such things. The peak load for a certain line in question, running from the step-down transformer would be when he had his motors in operation.

Q. Now, what have you to say as to the effect of the [68] leak in the roof of this mill, with water running down the beams or rafters or beams or anything of that kind and moistening the beams up to the

(Testimony of William L. Kimmel.)

place where this insulated wire was running along?

A. That would very much increase the tendency or decrease the resistance in the pack to the ground. Moisture is always an item which would decrease the resistance in the path of the ground. In fact, linemen will tell you that when they work on a pole which is wet, they find it pretty hard work on the pole that is wet. I mean by hard work, they get what we call a jolt when they attempt to make a splice on a line that is a 2300 pressure or higher, and there is most always one wire on a primary which will have a pressure partially ground or ground enough so that if they complete the circuit there, through the moisture on the pole they feel it so strong that it is hard work for them to work on it. And, under the condition you described, a leaky roof and wet beams in the mill, the tendency would be to leak across and it would form the other side of the ground. And supposing there was a ground somewhere between the generation pland and the transformer and you haven't a ground like the wet beams in the mill, the current would flow through there to wherever the right point was to set fire to the building. And if the neutral wire were grounded, I should say that would not happen.

I am familiar with the rules of the National Board of Fire Underwriters for electrical wiring apparatus.

Mr. SMITH.—Mark this for identification Exhibit 7.

(Document marked.)

(Testimony of William L. Kimmel.)

I have looked over Hawkins Electrical Code No. 6, and I think it is a standard work, yes.

Mr. SMITH.—Please mark it Exhibit 8.

(Document marked.)

Mr. SMITH.—I now offer in evidence note to section 14 on page 29 of the Articles of the National Board of Fire Underwriters for 1915, [69] and also paragraph 5, Alternating Current, Secondary Systems, found at the bottom of page 30, and running on to page 31.

(Handing document to counsel.)

(Which portion of Exhibit 7 was accordingly admitted in evidence, and read by counsel, as follows, to wit:)

(Reading:) Section 14. Transformers. "Where transformers are to be connected to high voltage circuits, it is necesary in many cases, for best protection to life and property, that the secondary system be permanently grounded, and provision should be made for it when the transformers are built."

Q. Mr. Kimmel, do we find a situation here that would fall under that rule? A. We do.

Mr. SMITH.—(Continuing to read.) "B." "Transformer secondaries of distributing systems (except where supplied from private industrial power or lighting plants where the primary voltage does not exceed 550 volts), must be grounded provided the maximum difference of potential between the grounded point and any other point in the circuit does not exceed 150 volts and may be grounded when the maximum difference of potential between

(Testimony of William L. Kimmel.)

the grounded point and any other point in the circuit exceeds 150 volts. In either case the following rules must be complied with:

1. The grounding must be made at the neutral point or wire, whenever a neutral point or wire is accessible.

2. Wnen no neutral point or wire is accessible, one side of the secondary circuit must be grounded.

3. The ground connection must be at the transformers or on the individual service as provided in Sections c to g, inclusive, and when transformers feed systems with a neutral wire, the neutral wire must also be grounded at least every 500 feet." [70]

Q. Do you find a situation here that would fall under that rule?

A. Yes, sir. There was an opportunity here on this transformer to provide for section 1 of that rule, that the grounding must be made at the neutral point or wire whenever the neutral point of the wire is accessible. I consider the absence of a ground on the secondary side of or lightning wire side of the transformer, a hazard to property under any and all circumstances. You always have the possibility there and probability some times that a high tension current will get into the secondary system, and of course, if they are turning on a socket in the basement or in a place where it is damp, or where they stand and touch a bathtub or something of that kind, it may complete the circuit and ground, and in the basement your secondary wiring running around it would be bound or apt to cause a path where the cur-

(Testimony of William L. Kimmel.)

rent could get to ground through a high resistance and produce a fire.

Under certain conditions the lightning-arrester in the condition, in which I saw it here Saturday, or in a defective condition—assuming that there was a defect—it could cause an excessive voltage in the transformer or increase the voltage in it. The question as I understood it was, "could the lightning-arrester raise the voltage on the transformer to which the same primary wire was connected that was connected with the lightning-arrester?" I could show you a condition under which it would. I would say under that condition, however, that it would not matter whether the lightning-arrester was defective or not. I have two ideas in my mind here. One of the lightning-arresters which I looked at here, and which has been partly identified as the one that was defective. As that lightning-arrester is now, it appears that it would perform its functions, as I said yesterday, Saturday. Now, I have also the lightning-arrester in which some of the witnesses describe the [71] air-gaps as so close that you could not put a piece of paper in between them. The resistance in that, of course the load would be on the transformer, according to the scheme I am going to picture out.

Here is a condition in which we have a transformer connected to a 2300 volt line. (Witness indicating.) Here is a 2300 volt line, and a ground here through the lightning-arrester box. This represents one side of a ten thousand volt line or a

(Testimony of William L. Kimmel.)

line with a higher voltage—I don't know just what voltage they had. A contact between that 10,000 volt line and this side of the primary here would come down here, of course, and complete the path through that, and would be high enough to do that, and in that case, that lightning-arrester there would complete the circuit through that side, and let the voltage on this transformer become almost anything up to the voltage that was on this line. Now, if that lightning-arrester were defective, the path of resistance would be a little less, and let a little more current through there. If there were no lightning-arrester on there at all, it would probably go to ground somewhere else.

I saw the transformer in the defendant company's shed. I should say it was very much the same as this outside of being a little different in dimensions, of course. The porcelain features of it, while they may not be exactly duplicates, were substantially the same as this. I saw that transformer about Thursday or Friday of last week. It was out by one of their men as being the transformer that was afire at the mill. The purpose of this piece porcelain on the outside is to insulate the low tension side of the transformer from the case; and the province of that round piece of porcelain in the middle is to prevent the wires from getting together in there. That is the wires of opposite polarity, and to [72] keep them away from the core. When these things are installed they are fastened up tight and the cover is in place on them and screwed down. The oil is

(Testimony of William L. Kimmel.)

poured right into the case. There are different practices, but we usually fill our transformers up over this terminal field here. We always cover the coil three or four inches over the coil.

(Transformer offered and admitted in evidence marked Exhibit 8.)

The WITNESS.—The insulation on the outside was broken.

Q. Now, what, in your judgment, might possibly be the effect, if there was any effect at all of breaking these pieces of porcelain here?

A. Well, that would allow a connection between the case and that wire that went though there, or any wire which went through the porcelain might come in contact with the iron. That would lessen the resistance in that circuit between the primary and secondary and it might to *to* ground through there and it would go to ground if the insulation became weak enough in between the frame and the lead in wires. If this were broken or the insulation got off these and they got together in any way that would produce a short circuit in the transformer. I cannot say just what the effect would be if there is a ground somewhere else but with a short circuit in the transformer it would probably blow a fuse of the transformer. With a short circuit on the secondary. Straight across the secondary it would always blow the fuse, providing the fuse was of the right size for it. We have had quite a number of cases where insulation would break down at this point and get into the secondary and then jump from here into the

(Testimony of William L. Kimmel.)

case. You might get a connection between the primary and the secondary in this way. There is an insulating piece between the two of them, being from one-eighth to one-quarter of an inch in thickness, depending on the size of the transformers, [73] of an inch in thickness, depending on the size of the transformers, and different voltages, and your potential is, always off one side of the line, grounded, assuming that this side was connected to earth and your secondary circuit was connected to earth, we will say, with a permanent ground. We will find that is a very good condition for it, and then if this side was grounded between this side and the secondary, you have your highest voltage. The whole voltage that is on the line would be across one side of this winding, and some point in the secondary which is adjacent to it.

If there were 2200 or 2300 volts in there you would get it. When they showed me the transformer, I think Mr. McDonald said that they rewound one section. I couldn't tell you just how long ago. That transformer has been patched up. Part of the case around here (indicating) has been broken and they put a piece of sheet iron on and riveted it to and had a new cover built. That piece (referring to Exhibit 10) is felt. I believe I could identify that piece. I was over there some time in February and at that time this piece was lying on the ground with others and I picked up and identified it at once as a part of a transformer.

(Testimony of William L. Kimmel.)

(Piece of felt introduced and admitted in evidence as Exhibit 10.)

Mr. SMITH.—Read what you find on that plate.

A. Transformer No. 958, 333, Type H, Cycle 60, form K, volts 2200, 19–80. 110–220, capacity 30 K. V. A. That indicates that the extreme end of the winding was designed for 2200 volts. That would be the primary current coming into the machine and 110 to 220 is the other side after it has been stepped down.

Cross-examination.

(By Mr. GROSSCUP.)

WITNESS.—I am one of the proprietors of a business established in [74] Spokane that design and install electrical plants. And in that connection, repair apparatus, including transformers. I went to visit Mr. Jordan's plant to see if I could sell him some motors, after the fire I sold and installed the motors he has. I have furnished him with several thousand dollars worth of electrical apparatus, at least two thousand dollars worth. At the time of about my visit, about a month after the fire I saw Mr. Jordan. We discussed the cause of the fire. I did not make up my mind as to the cause of the fire at the time, but have since. In making up my mind I have been influenced by certain facts which I have assumed to exist, as the basis upon which I made up my mind.

Q. Now, Mr. Kimmel, in determining the cause of this accident do you attach any importance whatever, as a cause for this fire, assuming that it was an

(Testimony of William L. Kimmel.)

electrical fire, to this lightning-arrester?

A. Yes, sir.

If the lightning-arrester was as I see it here, I would not say that it was a contributing cause to the fire. I would not say that it was necessarily at all, but if the lightning-arrester had not been there at all I wouldn't say.

Q. If the lightning-arrester had not been there the fire would have occurred under other conditions, as you have assumed them, just the same?

A. Some grounding on that line.

Q. Well, it is your belief that the fire would have occurred just the same if there had been no lightning-arrester there at all?

A. Well, I don't believe I could say yes, to that.

Q. Well, if the lightning-arrester, just as you have seen this, was there or if a lightning-arrester in perfect order was there, would there have been a fire just the same would there?

A. There might have been a fire. [75]

Q. Well, the probabilities of a fire would have been the same, other conditions being the same?

A. Yes, probabilities would have been there without that ground on the secondary.

Q. In other words, if the lightning-arrester was there in perfect order, then the other conditions being the same as you have assumed them, the fire would have occurred?

A. Yes. The fact that there was a defective lightning-arrester on there shows me that that wire did actually have a high resistance ground there. That

(Testimony of William L. Kimmel.)

is when I take into account the statement of the witnesses Stiles and Utter that those contacts were so close together that it was hard work to get a thin sheet of paper between them. I don't think I could say that the lightning-arrester would afford a ground, in any event you are *are* very liable to find a ground on one side or the other of the primary line. That is a connection to earth through some agency like a tree.

A ground constructed for the purpose of making a ground is a metallic contact with the wire that you are grounding and some ground plate—that is the earth you may say through the means of a ground pole or water system. We usually connect it onto a water pipe. I drive a pipe into the ground where there is moisture. Now, a high resistance would be where there was not a metallic contact. I would call the ground intended to be put in, a low resistance ground, one in which the current would flow freely into the earth or other conducting substance. The importance of a low resistance ground is to avoid the effect of a high resistance ground. Its function is to make the potential of the circuit in the secondary or low tension circuit of a certain known amount or known quantity above the potential of the earth, so that when you [76] stand on the earth and touch any part of the circuit, you know exactly what you are dealing with. The function of the low resistance ground or potential ground, is to prevent the accidental arcing such as incident to a high resistance ground. In other words, where you have a

(Testimony of William L. Kimmel.)

low resistance ground or intentional ground, you are not apt to have a flash or arcing such as is incident to a high resistance ground. If you have a low resistance ground, arcing is not likely to occur, providing a higher voltage is thrown onto the low side of the circuit. If the higher voltage—the circuit that conveys that voltage becomes metallically connected with the ground, it would carry off the current.

Q. Now, then, this rule says (*this rule says*), reading from this rule or section 14 which Judge Smith read: "The grounding must be made at a neutral point or wire, whenever a neutral point or wire is accessible.

2. When no neutral point or wire is accessible, one side of the secondary circuit must be grounded."

Now, I suppose that either one or two, paragraph 1 or 2 would obviate the result of a low resistance ground, wouldn't it?

A. Yes. I would say in this particular case, a ground on the neutral wire, or if they had that transformer connected up the other way, a ground on either wire would have done the work.

A good low resistance ground anywhere on the lightning circuit—that is, the secondary between the transformer and the ground would have obviated the danger of an arc incident to a high resistance current.

Mr. GROSSCUP.—Q. In other words, if there had been allowed resistance ground between the point of arcing—accidental arcing as you have described in your testimony in chief in the trans-

(Testimony of William L. Kimmel.)

former, that arcing would not have occurred? [77]

A. Yes. I said at a point along the ground wire it would be impossible to have an arcing. Now, wherever that circuit is completed. You asked about a current flowing through the ground wire, and that presupposes that you have got a circuit there of different potential across it. The whole circuit would be from one primary wire into the ground and across the earth and up from this ground to this neutral wire. Now, you undoubtedly would have an arcing in that other circuit. If you put two thousand volts on that secondary wire or circuit and it goes through the tubing you have a very favorable condition for an arc in the tubing and then into the ground. But in case your tubing was connected with the ground, that is the part that makes the circuit. If your two thousand volts goes into the secondary wiring, which is carried into that tubing and that tubing is of ground potential, then you have a very favorable condition for an arc in the tubing itself. I would say that the grounding of the tubing would increase the hazard rather than decrease it. I would say that every time you don't ground your secondary that would be the effect of it. In my examination in chief, I said there was such a thing as a maximum voltage in a system that is a high-peak voltage.

Q. And that high-peak voltage is reduced by putting on a load?

A. The idea I meant to convey to you was that the voltage was very often—I know it in practice—is higher than we mean to have it, and if you throw a

(Testimony of William L. Kimmel.)

big load off onto your governors cannot take care of it right away. I would say that these machines, while they are loaded or rated for 2200 volts that isn't intended to be the limit at all. It wouldn't be understood to be negligence to run 2400 volts. I would pass on 2400 volts as being perfectly safe. I would a little rather not run a 2200 transformer with [78] 2400 on it. As to whether it is bad practice, we sometimes have to do it anyway in order to get over cases where we have too much line lights, for instance, and we put a heavy load on our transformers, like a motor load or a planing-mill and that would draw our voltage down, and in that case we would boost the *the* voltage up and immediately the load is off, the voltage may pop up to 2600 volts. I wouldn't criticise this company for putting, under the conditions there at the end of the line, a current in excess of two thousand volts. I believe I would do it myself. Up to somewhere near 24,000 volts. And if that voltage ran up to the vicinity of twenty-four hundred volts, I would expect a dimming of lights when the motors were thrown on. And I would expect those lights to brighten up when the motors were thrown off. If you actually had 2400 volts on there, as the maximum voltage and you were using lights that were rated to 110 volts, and if you actually had a voltage of 2400 volts on your apparatus, the voltage on the light line would be about 220 volts. I would expect the lights, under such circumstances, to become very bright, providing you were using a 110 volt lamps. And I would ex-

(Testimony of William L. Kimmel.)

pect an iron that had been manufactured for a voltage of 110 volts to get very hot, when the motor was off. So I would not attribute to the variation of the light and heating of the iron to any disorder in the system.

If I were operating a plant and my attention were called to these variations when the motor was on and off, I believe I would tell them that it was about the best that I could do under the circumstances, without stringing considerable more copper on the line, and it would be impossible to overcome that, or perhaps I would suggest that they get a higher voltage iron. I cannot say that I would consider this as a symptom of the disorder of the [79] plant nor consider it of any consequence. We inspected our lightning-arrester about once a year or oftener if convenient. We inspected along in the spring and shortly after the rainy season, usually. If this lightning-arrester got into the condition that the witness Stiles yesterday claimed—with the air-gaps of the cylinders coming close together, that might have been caused by a stroke of lightning. The arcing on this particular cylinder (indicating), it doesn't seem to be as far as it is on the other cylinders and that would lead me to believe that it was pretty close to it, and so the arcing was pretty short. Taking the whole thing as it stands, I would say it had a discharge and evidently its resistance here didn't disrupt the charge. The burning seems to be excessive and even this last section seems to show considerable arcing. I have no idea, myself, as to

(Testimony of William L. Kimmel.)

when that discharge took place. That discharge might have taken place in August or September, or May or June, and it might have been more than one discharge, too. It may have taken place any time during the summer after the inspection. If they had a ground detector on the primary circuit, they would have known it pretty quick. They would have known that they had a ground there. That is if they had a ground detector for testing the ground on the primary wires, it would have shown this up. If the ground detector showed no circuit through there, that would show that there was no discharge taking place at the time they made the test. Assuming that that detector did not indicate that there was any discharge through there, and assuming that this apparatus as we see it here, was installed, I should say it would be pretty conclusive evidence that the proximity that this other witness described, did not exist, providing your ground detector was on that circuit.

Q. Now, you have assumed in the course of this discussion, **[80]** that this transformer, into which was attached the light wiring system, was burning at the time before it had been subjected to a high degree of heat from the burning of the building, have you not?

A. I don't know that is the case, but I think the probability is that there was considerable heat in there. It could have been such a fire exactly at the same time. It takes a little while to heat oil up.

Q. Well, you have assumed that Mr. Jordan saw

(Testimony of William L. Kimmel.)

this transformer heated up and burning before that heating up and burning may have been caused by the burning of the building?

A. I wouldn't hardly think it possible for the heat from the mill to do it. While it might set the pole afire right next to the transformer, I don't think it would set the transformer afire. There was an iron jacket around it, you know. I am not sure whether burned off. I don't believe it did but I believe some braces burned off and the poles fell down. I have assumed that Mr. Jordan saw this transformer burning and have probably taken that into account somewhat in attributing the fire to electrical causes. And supposing Mr. Jordan saw this transformer burning, I should say that the cause of the burning of the transformer was a breakdown inside of the transformer. I would say that would be the most probable cause and that breakdown would be attributable to a puncture of the insulating material, or of the lead wires which would be the same thing. It would be the inside of the transformer apparatus that the breakdown occurred, and I have taken that into account in assuming the cause of the fire.

I understood Mr. McDonald to say that they had replaced or re*q*ound one coil. And I have been further confirmed in my opinion by this remark, which I understood Mr. McDonald to make. But [81] leaving that proposition out and knowing the conditions which prevailed there, by listening to the testimony on that, I would say that your conditions there were just right to produce a fire where your

(Testimony of William L. Kimmel.)

secondary wires were located.

Q. Yes, I understand. Your conditions were just right to produce a fire if you had a breaking down of your transformer.

A. Or connection between your primary and secondary wires.

Q. In other words, it all reaches out to the question of the transformer being in disorder?

A. Supposing you had a contact between the secondary wiring outside of that transformer—the secondary and the primary. There is probably a most favorable case for it to occur, as in the transformer or in the case around the transformer. If the connection between the primary and secondary wiring was outside of the transformer, then the transformer would not burn. My idea about it is that this arc did actually boil that oil and boil it over and the oil would catch afire from the heat after it got outside of the transformer.

I had a conversation with another party who saw this transformer and I think he was honest in his opinion, and that had a further influence on me. It isn't a witness who testified here. I was influenced by the statement of someone who has not testified in this case heretofore, and that helps materially in my mind in having come to the conclusion and to a small extent I was taking into account the statements I heard other than testimony, when I answered Judge Smith that from the testimony I have heard here, I have come to a conclusion. I couldn't say that I have been influenced unconsciously in this case in

(Testimony of William L. Kimmel.)

attributing this fire as an electrical fire, because there were conditions there that were helpful to making it an electrical fire, because I wasn't [82] aware of all the conditions that might cause the fire to be attributable to some other cause.

Supposing that in the lighting system in this mill there was a defect in the wiring or in the sockets, or somewhere that caused a short circuit,—that occurs sometimes. And assuming a case where a socket is out of order and causes a short circuit within the socket, and that continues for a long period of time, —several hours,—and heats the socket red hot. I have had that same experience in a case where the lightning came through and jumped down from a socket to a stove. This was in a building in Gransville, Idaho, in a hotel. The socket was on a wooden ceiling and no plaster. Wallpaper all over and even covered with grease in the kitchen. The cord in this case took fire and burned up the ceiling and went out when it got to the rosette. The rosette burned out. I think but for that particular case, I have never heard of any fire being produced. It would have to go around that rosette, and a sudden arc on a low voltage system would very likely blow the fuse. These cords consist of copper wire in the center and insulated with rubber and cotton over that in the case of a common lamp cord. That cotton and rubber is inflammable. Supposing you had heat in that socket, it would produce consequent heat in the wiring, adjacent to the socket, and that let into the socket and would communicate that heat to the rub-

(Testimony of William L. Kimmel.)

ber and melt. I hardly think there would be enough dust accumulated on a cord in a sawmill, which had been used for five years, to drop. Admitting you had 120 volts on there. Those shorts will occur in sockets and usually occur when you snap the socket, but for a fire to occur when you do not snap the socket and for a fire to occur when the thing was let alone and nobody around there burning the lights and turning the [83] lights off and on, it might happen once in ten million times.

Q. Well, suppose there were rags such as the machinists use in cleaning their machinery and allowed to accumulate in a pile in that mill, more or less exposed, to the dust, and other inflammable substances, would not that be a reasonable and fair cause for a fire, independent of anything else?

I cannot really answer that. In cold weather you don't very often get a fire. I never heard of a fire from that source in cold weather. The temperature may arise to the point in hot weather, when you have linseed oil and waste and that sort of thing.

Mr. GROSSCUP.—Now, what is the purpose, Mr. Kimmel, of making a low resistance ground between tubes in which the wires run, or conduits, as you call them, to the ground?

A. I will have to study on that just a little. I never thought of that. I am not sure that I could answer that correctly, but as I would answer it after I studied it a little, my idea about that is that providing an accidental connection between the secondary wiring that is in that pipe, occurs so as to charge

(Testimony of William L. Kimmel.)

the pipes, that condition might render it so that it would be very unpleasant for anybody that touched those pipes. That condition might run along for some time but if you had that grounded you would open the circuit right away.

Mr. GROSSCUP.—(Reading from page 64 of the Underwriters Rules, Subdivision F., and on page 65:) "Must have the metal of the conduit permanently and effectually grounded to water piping, gas-piping or other suitable grounds, provided that when connections are made to gas-piping they must be on the street side of the meter"?

A. I will answer that, yes. They have prescribed it as a necessity. In order to lessen the chance of fire and shock I should say. Fire and life hazard.

Q. Now, then, suppose that this conduit system was not [84] grounded as a low resistance ground, then the danger of fire was increased, was it not?

A. Well, I cannot say yes to that, for in my mind there is always a chance,—I can always see then a certain path for that current to produce a sustained arc with that conduit system grounded and the secondary not grounded. The conduit then is grounded and the path of the current would be through this wire, and arc across to the pipe, and I think that in case that were grounded you would have a space that you knew was there. You absolutely know it. I should say that that being the case, if you left the ground off your secondary,—if you aren't going to

(Testimony of William L. Kimmel.)

ground that secondary you better not ground the conduit.

Q. Now, if Mr. Mills, the electrical inspector of the underwriters, examined this plant at the time these conduits were put in and examined in installation there, generally, and the installation was put in there under his inspection and supervision, if he had put in a low resistance ground between these conduits and the ground—knowing that there was no low resistance ground adjacent to the transformer, he made an electrical mistake, according to my opinion. I should say that he should have seen to it that there was a ground on the secondary, as well as on the other one. I think the rules were formulated somewhere around three or four years before 1915. I cannot say as to whether, for a long period of time, up to say 1912 or 1913, the fire underwriters were, a great many of them, condemned grounding of the transformer. In 1913, I had a discussion with several engineers of the Chicago-Edison Company at that time, and the question was then not thoroughly decided. That was in 1913. The advocates for grounding a secondary wire on a lightning transformer based their argument on that point. Without that ground on a neutral transformer, you may have any potential between the [85] secondary wiring of the ground up to the limit. With the ground on the neutral wire you are absolutely certain at all times as to what you have. You know that it cannot be more than half the voltage on your transformer. There had been at that time and prior

(Testimony of William L. Kimmel.)

to that time, quite a number of deaths growing out of or occurring in basements, bathrooms and other places, due to people just touching a socket and the light would be burning and the ordinary layman would say, "Surely that socket could not have two thousand volts on it and kill a person when a light was burning," but without a ground on there on your neutral wire, I can demonstrate to you or anyone else, and presume you have seen the same thing, that a light may be burning perfectly normal, and yet there be two thousand volts between the lighting fixture and the ground, and as soon as you put on your ground, the maximum will be half the voltage at the transformer.

Q. But wasn't there practically up to 1912, a general opinion that the fire hazard was increased by grounding, while the accident hazard was decreased?

A. I will say no to that. I will say this, however: It was at least acknowledged by most engineers that it was a little harder on a transformer and there is always that tendency to break down between the secondary and primary, if one side is grounded. But if you ground the neutral that brings a little lower resistance to the transformer, and the tendency was for the transformers to fail between the primary and secondary, and they had many punctures and it was a little expensive, and I think that was the main objection to it. It couldn't possibly be considered as an increase of the fire hazard to ground.

(Testimony of William L. Kimmel.)

Redirect Examination.

(By Mr. SMITH.) **[86]**

Q. Mr. Kimmel, I wish you would explain to the Court what you started to say on cross-examination, as to the liability of a fluctuation,—that isn't quite your word, but something similar to that, in these wires, going through that conduit, in the mill, and how that might be caused and what might be the cause of it. What you call boosting up the load, I think.

A. I said this, as I remember it: On any system similar to the one that we have been discussing, the removal of the load from that system, of course, tends to raise the voltage. It holds the load down till then and then there would be a tendency for the generator to speed up and raise the voltage. Of course, the governor would take care of that if it was working right, but we would naturally expect the voltage to increase as the load was thrown off and on. That is the way I account for this flat-iron getting hot. When they didn't have any line loss present, the voltage would be more than the iron was built for.

This outside testimony that I spoke of as taking into consideration was what a gentleman by the name of Miller told me. He is one of the defendant's witnesses. I saw him in Kalispell, in Judge Erickson's office. Mr. McDonald, the manager of the Power Company, was not present. **[87]**

(Testimony of William L. Kimmel.)

WILLIAM L. KIMMEL resumed the stand for further direct examination by Mr. Smith and testified as follows:

If Mr. Mills was in charge of this wiring job, it would seem to me that he should have seen that the secondary of that transformer was grounded as well as the conduit—to see that the rules were carried out.

Q. Do you mean to say that he should have grounded the conduit system?

A. If the secondary was, but in the circumstances of the secondary not being grounded, I should not say that he should not have grounded it in that case. If the secondary was not grounded, I would have been inclined not to ground the conduit, and I think he would do the same. I would not say that it was negligent construction on his part to fail to ground the conduit system in a case where the secondary was not grounded.

Mr. GROSSCUP.—Q. Now, Mr. Kimmel, don't you know that in the rules promulgated in 1903, they prescribe that the conduits should be grounded and that it did not require that the secondary should be grounded?

A. I am not familiar with the rules of 1903.

Q. Don't you know that the rules of 1910 prescribe that the conduit should be grounded but did not require that the neutral should be grounded?

A. They might have, but I am not familiar with it. We are always members of the school that believed

(Testimony of Fred Utter.)
in grounding neutral wires and always did it. We grounded the conduits. [88]

Testimony of Fred Utter, for Plaintiff (Recalled).

FRED UTTER, having been previously sworn, was recalled for further examination in chief by Mr. McDonald, and testified as follows:

I have heard the testimony here in regard to the heating of the flat-iron in the house near the mill, which was supplied by the same lighting circuit and as to the burning out of the lamps in this mill. That condition in the lighting circuit would indicate to me that the voltage was abnormal to what the mill was wired for; as to the effect of a sudden supply of that abnormal voltage that was being sent through the lighting system and then being subnormal for a time and then being abnormal again—I mean intermittently—I suppose it would work the same as expansion and contraction on anything—heat and cold—which would naturally deteriorate the insulation in time. If the insulation was the same as is ordinarily in plants, the wiring that is used is prescribed by the Board of Underwriters generally as a carrying capacity of from 250 to 600 volts,—wire will stand about 600 volts normally, and naturally if the insulation deteriorates and it gets below that to a point it would probably cause a ground anywhere the wire happens to touch, or between the wires themselves and it might cause an arc.

Q. It has been shown in the evidence, Mr. Utter, that one of the coils in the transformer was defective

(Testimony of Fred Utter.)

so that it required to be rewound. Would that defect in one of the coils in the transformer cause a condition to arise in the secondary which might be a fire hazard, or produce a fire hazard, in your opinion?

A. Yes, it could, I think; there are so many ways such a condition might be produced. Excluding the condition of possible contact between the primary and secondary causing a high tension current to flow through the secondary, if there was a current in the secondary and if a portion of the secondary was grounded or [89] cut out so that it did not take up the lines of force or the magnetic field that was set up in one end of the coil, and another coil was normal, you would have a circuit where it was a two wire circuit, one wire of one voltage and one of a variable voltage. That is, there would be a difference in the voltage in the two wires. That is, if you would make it to ground. I understand that a wire runs in an iron piping or conduit; it isn't permissible to run one wire of any voltage with another. Any alternating voltage in an iron armored conduit establishes a field. The two wires of a circuit in an iron pipe has no bad effect if the current is about normal in each wire. But in the case you state, with a defective coil, which could create a condition where there would be a difference in the voltage of probably several volts in the two wires, if they both run in this pipe, each wire would establish a field of its own and they would naturally have to equalize themselves if they both ran in the pipe. Each wire would set up a field of a different density, and in

(Testimony of Fred Utter.)

equalizing you would have a condenser effect. The effect of the condenser is to fall off practically from maximum to zero and from zero to maximum. I should judge it would be the same effect—the same as expansion and contraction. This is liable to produce several effects and on the insulation it is liable to cause it to deteriorate in time.

Q. And that might cause an arc in the other case?

A. It would weaken it. I didn't examine the transformer in the warehouse of the Power Company in Kalispell last week; I looked at them casually; I noticed, I believe, that some of the porcelain tubes were cracked or broken slightly.

Cross-examination by Mr. GROSSCUP.

Q. Mr. Utter, I want to go back to your testimony of the other day. I understood you to say the other day that you personally took down this lightning-arrester, off the pole?

A. I believe I took it down. I was employed by Mr. Jordan in [90] rebuilding the mill; I cannot just remember the date I took down the box but it was some time while I was at Kalispell. The first time I was in Kalispell was when I went in to look into the proposition to see what equipment he needed, etc., and I believe that as somewhere around the 10th of January, 1917, about a month after the fire. I am not sure I examined it at that time. I was there again in March and put in the installation and conduits; I took down just one box—the one that was shot.

Q. And what wire was that?

(Testimony of Fred Utter.)

A. It was looking from the mill—it was the right-hand wire looking away from the mill. The box was fastened to the pole in some manner but I did not take it down. I took the lightning-arrester out of the box. I got the transformer with which I tested the lightning-arrester from Spokane. I don't remember who was present besides Mr. Stiles at the time I tested the lightning-arrester,—several of the fellows that worked around there; I don't remember their names.

Testimony of Charles H. Stiles, for Plaintiff (Recalled—Cross-examination).

CHARLES H. STILES, having been previously sworn, was recalled for further cross-examination by Mr. Grosscup, and testified as follows:

These conduits had no metallic ground to my knowledge. This was an uncompleted job. We were working on them at odd times. It was started some year or so before and I put it in as I had time. All the *the* conduits in the lighting system within the mill were not in—most of them were.

Q. You didn't then observe the rule as prescribed in Subdivsion F, Rule 28 on page 65?

The rule is: "F. Must have the metal of the conduit permanently [91] and effectually grounded to water-piping, gas-piping or other suitable grounds; provided that when connections are made to gas-piping, they must be on the street side of the meter."

That was not done?

(Testimony of Charles H. Stiles.)

A. I don't think it is necessary to ground any conduit system until the work is completed and that is the reason this had not been done.

Mr. GROSSCUP.—I desire to introduce in connection with this examination, Subdivision F of Section 28, on page 65 of the rules of the National Board of Underwriters.

The COURT.—It may be admitted.

CHARLES H. STILES, recalled for redirect examination by Mr. Erickson, testifying as follows:

I helped make the test of the lightning-arrester. I borrowed a transformer from Mr. Kimmel in Spokane, took it to Mr. Jordan's office and connected the low tension side with the plug that I took a light out of, and put the plug in for my current for the low-tension side, and I got my high-tension side from the lightning-arrester. I didn't use the transformer that was used for that mill. I also examined the lightning-arrester when it was taken out; the porcelain of the arrester was smoked and in a blackened condition. I was at the mill when these lightning-arresters were taken down by the defendant company. I don't know how many there were—probably four or five and maybe six. When they took them down there was one on the south, that is the opposite one from the one that has been described as having had a charge of lightning through it, and then the center one, and then the one [92] that was in a bad condition. I saw the men congregate around the one that was in bad condition, but they didn't pay any special attention to the others, to my knowledge.

(Testimony of Charles H. Stiles.)

I do not profess to be an expert electrician. The work I did in the mill was under Mr. Mills' supervision. He did not order me to put in a ground there; I had not intended to put in a ground; the matter was never suggested to me. [93]

Testimony of Miss Olive Olson, for Plaintiff.

Miss OLIVE OLSON, having been previously sworn, was recalled by Mr. Erickson for further examination in chief, and testified as follows:

I have used the iron I referred to in my testimony at other places. At our home in Whitefish and I used it in St. Louis, after that. I didn't experience the same difficulty with it I had at Columbia Falls.

Witness excused.

Mr. ERICKSON.—That is all; we rest.

And thereupon the plaintiff rested his case in chief.

Testimony of Arthur Mosby, for Defendant.

ARTHUR MOSBY, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan, and testified as follows:

I reside at Kalispell. Am an electrician. Have had practical experience in electrical work since 1905. I run an independent shop and furnish electrical equipment and do wiring, sell lamps, fixtures, etc.

In the latter part of January, 1917, I had occasion to examine and repair transformers for the Northern Idaho & Montana Power Company. Mr. Grant called me over and said they had use for one of the

(Testimony of Arthur Mosby.)

large 30–K. W. transformers that had come from the Jordan Company mill at Columbia Falls and he was to use this at Whitefish, Montana, and wanted me to come over and then we had a talk about the best transformer in the lot to use up there. I picked out the transformer at that time. That was a 30–K. W. After we selected the transformer we tested it out. We took one of the similar transformers [**94**] somewhat larger than that, and on the same style, that we knew was in good shape and tested out the windings of the best looking transformer. We used two thousand volts, and stepped that down to 110 through the transformer. I didn't find any defect in the transformer at all. I examined the windings of the transformer and didn't find any defects. To determine whether the transformer was performing its functions or not we tested to make sure that there was no connection between the primary and secondary, and between the primary and the laminations, and no connection between the secondary wiring and laminations. We found no leakage from the high-voltage side to the low-voltage side by any of these tests or examinations which we made. The transformer was in first-class condition. I didn't pay any particular attention to the case, because they were all out of the cases at the time. I made no repairs on the first transformer at all. There were two other transformers there that we made tests on and looked over, but the porcelain block such as you see in the top there, was broken in the other two. I saw the iron case over at Ernest Schafner's place. They had been

(Testimony of Arthur Mosby.)

broken. That break in the porcelain block was a new break and was, in my judgment, the result of the fall from the posts. There was nothing there to indicate a fusing of any copper wires or anything else to indicate a flow of electricity—an excessive flow from the high-voltage side to the low-voltage side. The break was purely mechanical, the natural result of the fall. If it had been caused by a defect in the operation of the transformer on the pole there would have been a copper deposit on the porcelain itself, it would have been fused right into the porcelain. **[95]** That was the second transformer I examined.

Q. What repairs did you make on that?

A. Well, the supporting post like this piece, in the other transformer, when the other transformer fell, it must have fallen upside down, and it was broken off here. (Indicating.) It was bound to drive this out and these parts were broken and so we had to make some other kind of an arrangement to hold the transformer in its case, and then we substituted a hardwood block for the block that was in it, and we had to straighten out these leads. They were bent. And we had to retap them.

Assuming that these wires here were connected the high-voltage side,—the leads into the transformer, of the high-voltage current, and these on that side (indicating), connect the low-voltage side, there was nothing to indicate that there had been a breaking down or wearing away of the insulation or anything that would have permitted the current to flow from this side of the transformer, through the transformer case

(Testimony of Arthur Mosby.)

to the other side, that is from the high to the low-voltage side of the transformer. There was no indication of any weakening whatever on the inside of the transformer. The only other repairs I did was on the leads such as putting in new leads, after I had substituted the wooden plug. Before I made any repairs at all I sent the current through it to determine whether there was any leakage there or not. When I first made the test, before I made the repairs I used two thousand volts, and the other two transformers that were left, were sent over to the shop in March, later, and I tested those at four thousand volts.

Q. Now, we have the third transformer. You have testified as to two. And the third transformer came to your shop with the second? [96]

A. Yes. The third was a twenty-five or a thirty K. W. same as the others. All of same size. In the third transformer, the porcelain block was broken in it as in the second and the leads had been pulled off of the coils, and this same supporting block here was broken. (Witness indicating.) That is the leads here, where they fasten on the inside to the coils. They were all practically torn from the tapping in the holes. They were broken either by the fall from the poles or in rough handling afterwards. There was no fusing or anything to indicate that an excessive voltage had passed from one side to the other.

Q. Now, what repairs did you make on that third transformer, if any?

A. Well, in order to tie these leads down, we had to take the laminations off the transformer to get at

(Testimony of Arthur Mosby.)

the coils to retape them up and I had a man working there for me to take the laminations off, and then I took the coil out and he put the laminations back on again, and he helped me tape up the leads, and put the wooden block in. When I say taped, I mean I taped the leads. I didn't rewind the transformer.

Q. What was the condition of the windings on the transformer?

A. Well, on this last one it was skinned up. It looked as if it were the result of a fall. It had been scraped,—it wasn't an electrical cause. If that abrasion had been caused by electricity, the copper wires would have been pitted, either that or burned off completely and I didn't find that condition there. As to this third transformer before we started to make any repairs I tested it at two thousand volts. In my opinion there was no breakdown [97] or weakening in any one of these transformers, prior to my examination. There was nothing to indicate there might have been a weakening. There apparently was no puncture in the insulation between the coils. With the tests which I made, had there been a puncture in the insulation between the coils, there would have been a leakage made apparent at that time. It would have short circuited, and you could have told it very easily. I was assisted in this work by Fred Modesette. I am the only one in Kalispell that does this repair work. As to the leads inside of the transformer, they were still in the transformers. They had been, of course, ripped out of the case and there was no connection. We could have used the

(Testimony of Arthur Mosby.)

same leads if they were longer, but they had burned off from the outside, as a result of the fire they were in. If you take this lead out of the transformer you could see where they had gone through the porcelain bushing, and it showed that there was no fire in the case, but it showed that there had been a fire on the outside of the case, because it wasn't an electrical burn it was caused, in my opinion, by the fire of the burning mill.

Cross-examination.

(By Mr. McDONALD.)

Q. Mr. Mosby, examine that piece of iron on the floor. Do you know what that is?

A. Yes, sir. This is the inside. (Indicating.) I cannot tell whether it shows indications of burning on the inside, or fire. It doesn't smell like that was burned. On the outside it looks as if it got very hot. If it got pretty hot on the outside it might get hot on the inside but it doesn't smell like it was charred and doesn't show any indication of fire on the inside. [98] I am running an independent shop and do interior wiring. The power company at Kalispell hasn't done any interior wiring for some time. I do work for them such as wiring their transformers. I saw no evidence of leakage in the coils and the wires, and if there had been I would have observed the fused copper. It is necessary to make a test because you cannot always tell. If there was a leak between the secondary and primary coil, the primary being in between the two, you couldn't tell, and you would have to test it to find out. We made no test between the

(Testimony of Arthur Mosby.)

primary and the case. We made a test between the primary and the iron on the transformer, and if there was any connection between the primary and the case, there would also be a connection between the primary and the laminations. When I said the wires were burned off, I meant the insulation was burned from the wire.

Q. Now, suppose there had been a defect in the insulation of your primary at this point, where it enters the case, and another defect at the point where the secondary leaves the transformer; that is, there might have been a connection between the primary and the secondary through the case, that would not be apparent by an examination of the laminations of the coil?

A. Well, we wouldn't examine the laminations of the coil for a defect like that, we would examine the leads. If there was a leakage between this lead and these, the insulation would have to be punctured for that to leak, and we could tell that with the naked eye. If the leak were up under this porcelain we could tell with the naked eye. If it was punctured there it would leave its impression there just the same as if you took a knife [99] and skinned off the insulation. We made no test with the case at all because it wasn't necessary. I said that the insulation was scraped on one of the coils. When I said it was caused by the fall, it was merely a conclusion I arrived at from the fact that the transformer probably fell. The scraping had nothing to do with the electrical part of the transformer for that part. We

(Testimony of Arthur Mosby.)

could have left it as it was and it would have operated. We did not re-wind anything. We just retaped it. I said that in no case was there any discoloration that would show a burning inside of the transformer. There was no discoloration of the porcelain plate, except that it was smeared with dirty oil. The porcelain was broken in a hundred pieces, just as if you would strike it with a hammer. You could see that every crack was clean as a whistle. We made the test for the purpose of finding out to what extent they were damaged. They wanted to see which was the best transformer of the lot to use. I didn't know that Mr. Jordan was going to sue. And it was not my purpose to get evidence for this trial. I examined the taping to determine whether or not any of it had been burned on the inside of the transformer. I heard the testimony of Mr. Stiles and Mr. Utter that the taping was so burned that they could peal it off easily. You could scrape it off with a knife but it wasn't burned.

Q. Could you scrape that off with your fingers?

A. Well, you might get a good hold of it and pull it off. It wasn't charred, though. I was making the examination for the purpose of getting it in shape to work again. Setting it up in A–1 condition. In making the test we took a pair of small ones and hooked up 110 volts and paired them up this way (indicating) and that was so as to give two thousand volts on the outside. To make sure [100] that the transformers were in working condition and that they were getting two thousand volts on the outside. We

(Testimony of Arthur Mosby.)

rigged up a bank of lamps of 110 volts, and if they burned with brilliancy they had two thousand, and I paired them up and then I ran across a fuse wire on the outside and through the circuit so that I had four thousand volts on the outside. Then I took one of the leads from this bank of transformers and turned the current on and then I tested this side with both these coils. And then they showed clearly that there was no current between this side and that side. There was an electrical defect. I opened the switch when I made my connections here. Then I made a test from the high side to the ground. We hooked it on the laminations and tested it between the high side and the ground and that showed clear, and then we tested from the low side to the ground, and that showed clear and so we knew that the transformer was all right.

Q. Did you use as a lead one of the wires that had originally been in the transformer?

A. That is, we didn't make any changes in the wiring or the transformer at all. Just fixed it direct, you understand, and we watched the leads and kept them separated so there would be no danger of showing a short between the lead and the case, and then we hooked onto the leads that were on there and on the leads on the side. These leads were still on there. We were careful, however, to keep the leads separated because, if they came together it would be short. This porcelain being gone, of course, I had no means of testing this transformer in the condition in which it was when first found without some other mechani-

(Testimony of Arthur Mosby.)

cal device to separate [101] the leads because the transformer block was broken. When I bridged the terminal of the secondary coil with the testing wire here, I had no means of knowing whether a spark actually passed from this testing wire or not. If there had been any leakage at all it would have blown the fuse. When I got through with my test I turned it over and one of the outside coils was battered on the bottom and the leads were fully as much, and I told Mr. Modesitt to take out the laminations. The coil was damaged on the outside. Before that, we didn't connect our testing wire after we were through with our operation on the transformer. We disconnected those after we got through. We didn't short the testing wire and blow the fuse. We knew that the fuse was not in working order between the transformers. We knew that the fuse would have blown because of the transformers. We knew that the fuse would blow by a short through the transformer, it couldn't help but blow. Fuses do not blow on a dead short.

Q. You know fuses are commonly defective. I don't mean all fuses are defective, but it is a very common thing to find a defective fuse?

A. I never found such a condition. I never found one that failed to blow yet, and I have had considerable experience to, and I never found one that failed to blow.

Redirect Examination.

(By Mr. LOGAN.)

There wasn't anything on that lead to indicate an

(Testimony of Arthur Mosby.)
abrasion or weakening of the insulation that would carry the current of the transformer into the case.

Recross-examination.

(By Mr. McDONALD.) [102]
The test was made in March, 1917.

Witness excused.

Testimony of Frank Modesitt, for Defendant.

FRANK MODESITT, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan, and testified as follows:

My name is Frank Modesitt. I was in the employ of Mr. Mosby in January and February and March, 1917. I helped Mr. Mosby to overlook and examine some transformers in January, 1917. Those transformers were sent there by the Northern Idaho & Montana Power Company. Mr. Mosby did not do any rewinding of the coils on those transformers or any of them.

Q. What was the nature of the work he did?

A. These leads here were all broken. This porcelain, I think on both of them, and these leads were all bent together, and so that we took these leads and straightened them up and then Mr. Mosby made a test on the transformer and after he made a test he had me tape all these leads here and shellac them. I didn't do any winding on the coils.

Witness excused. [103]

Testimony of A. J. Grant, for Defendant.

A. J. GRANT, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan and testified as follows:

My name is A. J. Grant. I have been an employee of the Northern Idaho & Montana Power Company since June, 1910. I am familiar with the work of the company. It is my line of work. I installed the transformers in 1914 on the A. L. Jordan Company mill job. I installed three 30–K. W. transformers. It is the only bank of three of that size that I know of. I think that Mr. Ball took down the transformers after the fire. I saw them when they were sent to Mr. Mosby for examination. The transformers that Mr. Mosby overhauled were the same transformers that were *en banc* there at the Jordan company mill at the time of the fire. I was present when he examined them and tested them. That was a week or maybe a little better after we got them from Columbia Falls. At the time I was there he made the test of 2,200 volts. One of the transformers was badly shattered from the fall but so far as the burns or anything of that kind were concerned it was not in bad condition. I could see no evidence of electrical burns. I think we tested all three at that time. I know where those transformers are now. One is serving the roundhouse at Whitefish. I installed it. Another is operating on the east side of Kalispell for electric stoves and lights, and the other one is in the wire room in Kalispell. We have had no trouble with their working, either of them.

(Testimony of A. J. Grant.)

I took down the three lightning-arresters. They were on pole back from the transformer at the Jordan Lumber Company mill. I also took down two at the Soldiers' [104] Home two weeks later. These five lightning-arresters in the courtroom now are, to the best of my recollection, I am almost sure of it, the five I took from the Soldiers' Home and from the Jordan Mill. As I took them down I took them to our little store at Columbia Falls. I am sure that three of these lightning-arresters are the ones that were at the Jordan Lumber Company mill. I took them down about the first of April or the last of March in 1917. When I took them down I opened the three and looked at them. I didn't test them; I just looked them over. They looked in pretty good condition. I am almost certain they are in the same condition now as when I took them down. I didn't notice that any of the brass cylinders in any of those lightning-arresters came in closer contact than they do now. These lightning-arresters remained in the little storeroom at Columbia Falls until a few days before the trial. There was no repairman at Columbia Falls. We brought them down to Kalispell to bring over here. I look after the line work, mostly all of it, and the placing of such equipment as lightning-arresters would be my work. If a lightning-arrester was to be repaired, I would know of it. I generally do. As to why these lightning-arresters were taken down, we took them down and replaced them by Westinghouse by a General Electric. We did not take any of these lightning-arresters down

(Testimony of A. J. Grant.)

because they didn't perform their functions. I wired the transformer there at the Jordan Mill.

Q. Now, Mr. Grant, look at Exhibit 11.

A. That is a general plan of the sawmill up there, and the railroad tracks. These lines indicate the railroad. The mill is opposite the depot across the tracks. This little section here in the northwest, indicates what were [105] the poles,—this cross. That indicates the transformers, and their connections I sketched the transformer and Mr. March, the city engineer drew that plan. But those transformers were connected up according to that diagram. I did the connecting, with the help of some ground men and helpers I had.

Cross-examination.

(By Mr. SMITH.)

As to where the particular transformer that this piece of iron came from, I cannot say for sure but I think it was in the wareroom at Kalispell. It has not yet been reinstalled. I wasn't directed by anybody to bring it here to the trial.

Witness excused. [106]

Testimony of W. B. McDonald, for Defendant.

W. B. McDONALD, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan, and testified as follows:

I was local manager of the Northern Idaho & Montana Power Company, Kalispell, from 1910. I have heard the testimony of Mr. Kimmel to the effect that

(Testimony of W. B. McDonald.)

when he went over to examine the transformer a few days before the trial that I was present and said that the transformer had been re-wound. I had no conversation with him to the effect that the transformer was re-wound. I said that the leads from the coils was damaged and it was fixed by Mr. Mosby, and if he wanted any information he could go to Mosby and he could probably tell him more about it than I could. I voluntarily permitted these people to have access to our plant and to refer to this equipment and the transformers I had on hand, and told them where the other transformers were, and gave them all the information they asked for.

Cross-examination.

(By Mr. McDONALD.)

Q. Mr. McDonald, don't you think that you might have said at that time that one coil was re-wound?

A. No, there is a misunderstanding there. I said, the terminals of the coils, that they were damaged. I remember the occasion of last Thursday in the city of Kalispell, there being present myself, Judge Erickson, Grant, Utter, Mr. Stiles, Mr. Kimmel and there was something said about the transformers because we took the cover off so you could see the coils there. I didn't say then that Mosby re-wound those coils. There was a conversation about coils, I remember that distinctly but [107] the conversation in substance to the effect that one of those coils was re-wound by Mosby did not take place.

Q. Do you know, of your own knowledge, whether or not one of those coils was re-wound?

(Testimony of W. B. McDonald.)

A. No, sir, there was none of those coils re-wound, because I inquired. I always ask when we have transformers where we have any trouble. There was a question about the transformers at this time. I asked the condition they were in and he told me that the casings were pretty well broken, and I asked if the coils were burned, and he said no. I said if there was anything with reference to the coils, Mr. Mosby would know.

Redirect Examination.

(By Mr. LOGAN.)

I said that the leads from the coils was fixed, because I knew the leads had new wire put on. I said something about there being re-taped at that time, because there *was the* insulation wore off, or bruised on the outside of the coils of the transformers and that was, of course, fixed and replaced.

Witness excused. [108]

Testimony of Pete Boyle, for Defendant.

PETE BOYLE, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan and testified as follows:

My name is Pete Boyle. I am an employee of Mountain States Power Company. I went to Columbia Falls after the Jordan fire to look after the company's equipment there. I went there the day of the fire in the afternoon, Christmas Day. I cut off the primary wires there. They were handing pretty low around the cottages and I cut them off and came

(Testimony of Pete Boyle.)

back to Kalispell. I cut them off from the cottages about a hundred feet from the transformer poles. The transformer poles were thirty-five feet high. Thirty-five feet long, that is twenty-nine feet out of ground. The primary wires were tangled on this pole here (indicating). That is back where these lightning-arresters were about one hundred twenty feet west of the mill. I cut them off and fastened them up as high as I could reach. I looked at the transformers that were lying on the ground. The north pole was burned pretty bad. I guess about eight feet of it burned off the top, and I don't remember whether this was all burned down or not. Maybe ten or fifteen feet sticking out of the ground. But the transformers had fallen to the ground. The transformers were about eighteen feet above the ground before they fell. When I saw them, one of them had fallen top down. It was upside down and the other two—the second one the top was broken, but the third the top was all right, but the top was broken on the one upside down. That is the top cover The third one was practically intact. Some of the porcelain tubes were burned. I think one transformer was all right. That is the secondary. It was [109] all one block of coils in one. I looked after the removal of these transformers. I picked them up and went over the following day and cleared up the primaries of the first pole from the transformer, and I took it over to the shed about forty feet away. I came back about ten days afterwards and had them shipped to Kalispell. That was on the 4th of January. The third

(Testimony of Pete Boyle.)

transformer, which is now in the warehouse, has not been put in service for the reason that we have had no use for it. We have had no use for one that size. It is a 30–K. W. transformer. The company has no other 30–K. W. transformers, except these three, at this time. Nor any others since the fire.

Cross-examination.

(By Mr. SMITH.)

We did not have any particular place to put this 30–K. W. transformer. The transformer now in the warehouse in Kalispell was installed on that pole at the Jordan Lumber Company plant in February 1914.

Witness excused. [110]

Testimony of Carl Miller, for Defendant.

CARL MILLER, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan, and testified as follows:

My name in full is Carl Miller. I reside in Troy. I was in Columbia Falls on Christmas Day, 1916. I was in the employ of the Barrabee Electrical Company of Kalispell. The Barrabee Electrical Company sells electrical equipment and wiring, fixtures, etc. I happened to be in the Gaylord Hotel in Columbia Falls the night of the fire and shortly after the news there was a fire, the lights went out and I called Kalispell to get Mr. Grant and Boyl, because I had an idea of the trouble and what it was, and the operator got hold of Mr. Grant and Mr. Grant was

(Testimony of Carl Miller.)

evidently on his way from the hotel over to the Power station when I called, and so I went up to the fire and told the operator when she got Mr. Grant to have him call me up there. So, at the time I got to the station he called up and I *golt* hold of him and he told me to go ahead and clear the wire so he could put the switch in. I got to the depot about 12:30 o'clock. The hotel is about a mile from the mill. When I got there, the building was on fire and there was an awful wind coming from the fire and the flames were coming towards the transformer poles. I did not go very close to the transformer poles. The wires were hanging down close enough for me to reach them and I cut them. The wires were hanging down at the pole where the lightning-arresters were, about one pole from the transformer pole. The wires were sagging down. I didn't notice the cause of the sagging unless the top cross-arm had burned down. When I found the primary wires were sagging, I cut them off and tried to fasten them on the next pole the best I could to [111] clear them. They were dead at that time. I then informed Mr. Grant that I had cleared the wires. The current was put on and the lights came on again in town. I did not notice any unusual condition around the transformers that night. I don't know how close I got to them, I don't suppose I got within forty or fifty feet of them. It was very warm there with the flames blowing toward that way. I did not see Mr. Jordan there at that time.

(Testimony of Carl Miller.)

Cross-examination.

(By Mr. ERICKSON.)

I do not know who I saw at the fire when I first got there. There were several men around there but I didn't know any of them. I saw Mr. Jordan but I don't remember seeing Mr. Jordan right when I first got to the fire. The fire had been burning probably forty or fifty minutes when I got there. I do not think I saw Mr. Jordan with the hose trying to put out the fire. I saw him at the fire but I don't remember seeing him with the hose. When I went down there the whole west side of the building was burned. When I got down there I didn't notice any fire in the transformer. The poles were burning. I didn't examine the transformers particularly. I was in your office last Thursday. I didn't say there in the presence of Mr. McDonald, Mr. Kimmel and Mr. Utter and yourself that the transformer was afire. I said that the poles were burning and I couldn't say whether the transformer was burning or not.

Witness excused. [112]

Testimony of M. E. Thomas, for Defendant.

M. E. THOMAS, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Logan, and testified as follows:

I have seen this lightning-arrester before. I saw them the first time when I went up to Columbia Falls to reconstruct, on March 21st, 1917. I went with Mr. Grant. I assisted Mr. Grant in removing these ar-

(Testimony of M. E. Thomas.)

resters from the poles there at the Jordan mill. We opened them all as we took them down. Mr. Grant done the work. We had two helpers there. I noticed nothing in particular the matter with these lightning-arresters except they had received a jolt of lightning some time prior to that, which is a common occurrence in lightning-arresters. I do not recall this particular lightning-arrester. If it is one of the lightning-arresters that I saw that day, it isn't any different now than it was then, to my knowledge. I did not notice that in any of the lightning-arresters we took down that day that there were any cylinders in closer contact than they are here, now. We took down three from the Jordan Lumber Company mill and two from the Soldiers' Home, and we put them in a little shed at the substation at Columbia Falls and left them there. The last two were taken out about a week ago Monday or Tuesday. They were taken to Kalispell. They were two out of the five here. The other three were taken by Mr. Grant.

Cross-examination.

(By Mr. McDONALD.)

The arresters were brought down to Kalispell explicity to be used at this trial. I took them down about a week ago Tuesday. The two taken down from the Soldiers' Home [113] were replaced with Westinghouse, and the ones taken down from the Jordan mill were replaced with Westinghouse at the new mill. It has been at least a year since these arresters were taken down. We did not take them down for the purpose of using them in this trial. My

(Testimony of M. E. Thomas.)

interest in these arresters was merely casual, and when we replaced them with Westinghouse we had no idea whether they would be used again. I didn't make any identification of the arresters. I helped put them in the small warehouse and never saw them since until they were brought over here for this trial. I don't know as I can say how many of them were struck by lightning. That is a fact that can be seen in any lightning-arrester that has been in service for a number of years. They were somewhat pitted.

Mr. LOGAN.—We will offer this map to get reference to the diagrams of the transformers themselves, without reference to the buildings.

COURT.—Very well.

Witness excused. [114]

Testimony of B. H. Clingerman, for Defendant.

B. H. CLINGERMAN, a witness appearing on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Grosscup, and testified as follows:

A. I was the assistant general manager of the Northern Idaho and Montana Power Company on Christmas, 1916, and for some time before that. I am a graduate electrical engineer of the Massachusetts Institute of Technology. I was graduated in 1904. I have been engaged almost wholly in work connected with the operation of public utilities, mostly under two large operating companies—J. G. White and Company of New York and London, and H. B. Billsby of Chicago and London. My first

(Testimony of B. H. Clingerman.)

work for J. G. White and Company was in Youngstown, on electric railway construction, and then in Wilkes-Barre, Pennslyvania, where I had to do with about 35 lines in connection with the distribution of electric energy. Since leaving White and Company—aside from some work for the Applegard system of electric railways, and the People's Heat, Light and Power Company of Springfield, where I was employed by Billsby of Chicago, I was employed by Billsby of Chicago, at Mobile, Alabama, about seven years, and then in Tacoma, Washington, in connection with the Northwestern Idaho Montana Company. Billsby and Company and J. G. White both specialize in electrical engineering. I have been here throughout this hearing and heard all the testimony.

Q. It is charged here that the Jordan mill was burned from electrical causes. The fact that the mill burned is undisputed. Now, it has been testified here that some time prior to the fire, and from the date that the three transformers were installed at the mill in February, 1914, there was a fluctuation of the lights and also a fluctuation of the intensity of heat with which the iron in one of the cottages was heated. You may explain to the [115] Court, the cause of such fluctuation, and state whether or not you know to what that should be attributed.

A. I can explain the situation which is more or less usual, by using a comparison. If you turn on the faucet in a dwelling-house you get a pretty good pressure of water, but if you turn on all the faucets

(Testimony of B. H. Clingerman.)

and take a considerable quantity of water from them your pressure is not so good. In this particular case, the company had three transformers connected together, as we say *en banc,* to provide the proper kind of current for the operation of the motors. A three-phase current. From one of those transformers a tap was taken off so as to supply to the mill current at the proper voltage for lighting. Now, when all the motors or many of them were in service for the mill, there was what we call a drop in the transformers. Ordinarily that drop may be from two to five per cent or thereabouts, but there is always some drop. Now, the lights burning on the lighting circuit would burn with dimness or brightness, relatively speaking, in accordance with whether or not the motors were being used. I should not think that the fact that these lights were dim when the motors were being used, or in use, indicated any derangement or disorder of the system, or improper construction of the system. It is quite common in electrical plants for lights and irons to operate in the method testified to in this case. A lady has testified here, a Miss Olson, that her flat-iron became excessively hot,—hotter than when she used it some other place. Electrica Flat-irons are manufactured usually at a rating of 110 volts, on circuits having a nominal voltage of 110 volts, but they are also manufactured with a nominal voltage of 120 volts, and in those cases where public utilities are operating at 120 volts, customers can get better service by using a 120-volt iron. If 120 volts were supplied to [116] a volt iron, it would get hot quite rapidly.

(Testimony of B. H. Clingerman.)

The voltage supplied by the lighting line at the Jordan mill was somewhere around 110 to 125 volts. That ought to cover the conditions. Possibly a little less than 110 if the wiring was light. There is a drop in the transformer and a drop in the wires to the building, and there is a drop inside of the building, that all enter into consideration. These transformers are marked here for 2200–1980–110 and 220 volts and are constructed so that they will take a higher voltage without injury. It is quite usual to find public utilities using 3500 on a 2200 volt line. The object of using a higher voltage is to compensate for line drop between the power plants. I have examined the Kalispell plant in connection with my supervision. The voltage supplied to the Jordan mill, normally, was 2200. By that I mean a voltage anywhere between 2200 and 2400. The fact that we had this fluctuation would not indicate an abnormal condition.

Q. Now, there has been a great deal of talk about these lightning-arresters. Supposing that one of these lightning-arresters did have one, two or three cylinders so placed that they were in closer contact than they appeared to be here, at this time, what would have been the effect on the system?

A. It would have decreased the resistance by which lightning would have to pass to ground.

Q. Well, suppose that this accident or fire is in no way attributable to lightning, what effect would it have towards causing a fire at the mill?

A. I should say that if the fire was an electrical

(Testimony of B. H. Clingerman.)

fire, it probably would have happened whether or not the lightning-arresters were there or not, and it would make no difference whether the lightning-arrester was in the sort of order that Mr. Utter described [117] it, or in its present order. In other words, the condition of that lightning-arrester, in my opinion, does not enter into consideration at all, as to whether it was an electrical fire or otherwise. I don't think it has any probable bearing on the cause of the fire. It appears in this case that the light wiring inside the mill were encased in steel conduits. I should say that interior metal conduits should be grounded effectually. I can state from my own knowledge that I saw this rule in the book of Underwriters' rules in 1902, and, as far as I know, it has been there ever since. The understood practice, under the general engineers that I have worked for, is to ground metal interior conduits. The purpose is to reduce the fire hazard. It provides a low resistance path for any current that may leap from the wires to the conduit and to the earth, without forming an arc, where it goes to the ground. In other words, it is a safety valve. In the book of 1915, the Underwriters provided for grounding the neutral at the transformer. The history of that rule is about as follows: Somewhere between 1900 and 1910, I think, the National Electric Light Association became interested in the prevention of accidents by grounding the neutral of a transformer. They brought the matter up before the National Board of Fire Underwriters, and tried to get the Board of Underwriters to insert the rule in the book of rules.

(Testimony of B. H. Clingerman.)

The idea in the minds of the heads of the National Electric Light Association was the reduction of the life hazard. They endeavored to get the National Board of Underwriters to put the rule in their books of rules and they objected. The matter dragged for several years, and finally they agreed, and the rule is in there as a rule apparently for the reduction of the fire hazard, but its primary purpose is the reduction of life hazard. There is no controversy among electrical engineers as to whether or not the [118] *the* grounding of the neutral is a good or bad practice. The rule is in the book and we all live up to the rule more or less. All companies have not grounded their transformers. The grounding of the conduits in a lighting system provides a path of low resistance to the ground for the excess current and, therefore, serves the purpose of carrying off any possible excessive current through either failure of the transformer or otherwise. Where the transformer has not failed to perform its function, but there has been some disorder in the lighting circuit itself, the ground on the neutral conduit serves as a means of passing off to the earth any current that might go into the metal conduit by reason of defective insultation, without causing an arc at the point where it leads to the conduit in question.

Q. In other words, where the conduits are not grounded, might a fire occur,—an electric fire occur where the conditions and surroundings of inflammability were favorable, without there being any disturbance or failure of the transformer or excessive cur-

(Testimony of B. H. Clingerman.)

rent being thrown on the lighting wires, through the transformer?

A. The absence of the ground, or course, would mean that the current would tend to go to ground through some other way, and if that happened to be a blowpipe or anything else of that kind, it would go that way. Suppose that this transformer showed absolutely no evidence of failure to perform its function and there is no evidence of excessive current passing from the high side to the low side of the wiring, and nevertheless a fire did *did* occur amidst the conditions of inflammability in that sawmill, the failure to ground the conduits would be a contributing cause, that is, a partial contributing cause. The other might be a break in the wire itself. In other words, there might be an electrical fire without the transformer in any way failing, or without there [119] being any arc at the transformer which would carry the high tension to the low tension wire.

Q. Now, suppose that the evidence showed that this transformer was in no way failing to perform its functions, and bears no evidence that it did fail to perform its functions, then would the fact that the neutral was not grounded have any effect or influence on the question of whether there was an electrical fire or not?

A. That brings up the subject of the grounding of the neutral. It is held by many of us that grounding of the neutral in case a transformer performs its functions as it should, without breaking down,—the grounding of the neutral furnishes one ground and it

(Testimony of B. H. Clingerman.)

requires only one ground to complete the circuit on the other side of the transformer and it therefore increases the fire hazard in that way. Assuming that there is no passage of high voltage to the low voltage wires, the failure to ground the neutral could have no effect—could not cause the fire in that case. Assuming that this neutral was not grounded and the conduits were not grounded, and assuming that the transformer was performing its functions, there could have been an electrical fire to have destroyed the mill—a socket could break down and cause it to heat. That would possibly cause it to set fire to the inflammable material there. Any short circuit would tend to explain the fire. We receive bulletins from fire insurance companies stating the different causes of fire, and in that way the subject comes to my attention in a general way. Accumulation of such waste as is ordinarily accumulated around machinery would constitute a fire hazard.

I have heard the testimony with reference to this transformer and lightning-arrester in this case. I have examined the blue-print (Exhibit 11) to see how this bank of transformers was [120] installed with reference to wiring. I should say that this form of construction is good construction as to in what respect it protects against the jumping of or arcing of the current outside of the transformer. The main essential in construction of this sort is to keep the high voltage wires away from the low voltage wires, which these schemes accomplish. There would be no probable connection, nor would there be no probable jumping of the current or arcing of the current out-

(Testimony of B. H. Clingerman.)

side of the transformer, if the construction was as shown on that blue-print. The essential idea is there could not be and cannot be, and that idea is carried out here. (Witness indicating.) This is a side view of the transformer and pole. On the top arm is located the high voltage wires, and they come down on the back side of this cross-arm through fuse plugs, and then down to the back corner of the transformer. Now, the essential idea in all our construction is to try and keep the high voltage wires from the low voltage wires. These wires are insulated, yet if the wires here run against the wire here, they will jump, so that we try to give them space.

Q. Now, Mr. Grosscup, there has been a suggestion here in the testimony that there may have been an arc inside of the transformer, which permitted the high-tension current to flow into the low side without going through the transformer through some defect in the wiring, instead of the transformer itself, and there has been also a suggestion, or some testimony to show that when this transformer, after the fire was taken to the warehouse, there was an abrasion on the covering of these lead wires inside of the transformer. Would a practical man, having experience with apparatus of that sort, be able to tell whether those abrasions were caused by external force; for instance, [121] a fall or because of an electrical current?

A. He would be able to detect the difference. It would be perfectly manifest. If the windings were burned out, I should say that the transformer would emit a smell which would be unmistakable. That smell would continue for a long time—six months or

(Testimony of B. H. Clingerman.)

more—so that when Mr. Mosby examined this, assuming that he is an experienced and practical man, I should say that he could look at the transformer and smell the transformer and determine whether or not the transformer was burned out, but it is easily conceivable that a puncture might exist from the high to the low, which he could not smell, but could detect by testing it. I heard him testify that he did test it and that is the ordinary and practical way of testing a transformer—the way in common use—and such a test as this would disclose whether or not there was any puncture.

Q. Taking all the testimony together, Mr. Clingerman, as you have heard it upon this trial, and assuming that everyone has told the truth, what would you say was the cause of this fire, if you know? Can you form any conclusion as to the cause of the fire?

A. I rather feel that it is not an electrical fire. I have not heard any evidence tending to show that it was an electrical fire. It might have been that. Assuming that it was an electrical fire, it occurs to me that the transformer is all right. That eliminates one cause of fire. There is no testimony to indicate that the fuses were out of order and it is very probable that the fire was caused by short circuit in the mill. The fuses would blow. While it is possible that the fire might occur by short circuit in the mill due to a defective socket, in my mind it is not probable that the fire was an [122] electrical fire.

Mr. GROSSCUP.—That is all.

(Testimony of B. H. Clingerman.)

Cross-examination.

(By Mr. MacDONALD.)

Q. Assume, Mr. Clingerman, that the lead wire into the case was stripped and then after the fire it was found to be fused by fire and the wires leading into the secondary were without insulation between them and the porcelain top which formed the insulation between them and the case had been broken by some means or other, isn't it possible that a current might have passed through that case from this insulation which was afterwards fused—fused through the case and out of that secondary? And wouldn't that let the load from the primary in onto the secondary?

A. Yes, assuming that the brass cylinders in the electric arrester were fused and the air gaps in the lightning-arrester were closer together than their normal condition, it would induce the resistance of the passage of the current to earth. If on that primary which is carrying 2200 volts and sometimes more, there were connected a lightning-arrester, which would leak with that pressure upon it, it might form a permanent and constant ground when the primary system was carrying a load of at least 2200 volts. If a test would show that it would leak under a pressure of 2200 volts then it would not necessarily form a permanent accidental ground. A lightning-arrester would break down on this rated voltage would probably burn until it burned itself clear—that is why we don't know about lightning-arresters burning. In my public utility experience, we always

(Testimony of B. H. Clingerman.)

assumed that there is another ground, and if it didn't happen to have another ground, that potential in there would be merely a potential. I stated that the conduit in the secondary should properly have been [123] grounded. That would be true with equal force if the neutral wire were not grounded. The idea of the ground is to conduct the stray current resulting from defective insulation, directly to the ground without an arc, and it serves that purpose whether or not the neutral from the transformer is grounded. I cannot say that it would constitute an additional fire risk. I heard Mr. Kimmel testify in reference to the passage of this current from the secondary in the conduit to the conduit and down through the ground and back to the accidental ground. Perhaps an arc would be formed between the wire and the conduit, but the grounding of the conduit eliminates the arcing between the conduit and the pipe that conduits it to the ground, but does not eliminate the arcing between the wires and the conduit. That cause might exist notwithstanding the fact that the conduit was grounded. The grounding of the conduit provides an additional ground between the conduit and whatever happened to be in connection with the conduit itself. The grounding of the conduit reduces the fire hazard, because it furnishes a permanent path for the current to go to ground. Assuming the diagram you have in hand is the conduit and with two wires inside. Now, if that conduit is grounded there would be no arc formed between the conduit and the ground. That

(Testimony of B. H. Clingerman.)

wouldn't eliminate the arcing between these wires and the conduit, but the fire hazard would not still exist, as Mr. Kimmel states. If your ground exists on this side—this accidental ground—and you have a good working ground here, why your circuit will be completed between these two grounds, rather than running through the mill and arcing. If your neutral were grounded, both the arc outside and inside of the conduit would have been eliminated, if the primary and secondary wires were in contact. Assuming that the primary and the secondary wires are not in contact, the value [124] of the grounding of the conduit to prevent fire between the secondary wires is because it furnishes a low resistance path to earth in case the insulation is defective. The idea is that there may be two defects in the insulation one place to another. There has to be two grounds to produce a circuit. If one is a dead ground there would be no arc. If the conduit was grounded for that purpose there would be no arc there.

Mr. MacDONALD.—Q. Mr. Clingerman, using this diagram—a ground from the conduit to another ground from the secondary and assuming a leak between one of the secondary wires to the conduit, and this ground, would this ground convey away that potential?

A. Well, assuming the case of the grounded neutral or some other ground to produce the arc, and assuming that a defective socket caused the fire, it should blow the fuse.

(Testimony of B. H. Clingerman.)

Redirect Examination.

(By Mr. GROSSCUP.)

If there was an overload on the secondary circuit, or the lightning circuit, by reason of the failure of the transformer to perform its function, that ought to blow the fuse. In other words, the whole question is predicated on the failure to blow the fuse. If the fuse would perform its business there would not be a fire. The fuse is there for the purpose of protecting property. A direct ground or low resistance ground would prevent what Mr. Kimmel has attributed here to an arc attributable to a high resistance. In other words, if Mr. Kimmel's idea was that this current poured in on the light wire, it would find its way to the ground and then back somewhere around into the system, running a current through the ground by means of a contact between, perhaps, the conduit and the blowpipe. That arc would be eliminated by the permanent and effectual grounding of the pipes. If, as Mr. [125] Kimmel testified that through the failure of the transformer of arcing around the transformer, a heavier current on the lightning side would find its way through the conduits or wiring and through at a point which he described as low resistance—possibly the blowpipe, and it would form a spark in jumping across from the tubes to the blowpipe for instance, and under inflammable conditions might cause fire. A direct or low resistance ground would eliminate that danger. That is one of the purposes of the low resistance ground. In order to form a circuit there cannot be a passage of elec-

(Testimony of B. H. Clingerman.)

tricity without the opportunity for a circuit. That circuit may pass through the ground, the earth or through a metallic substance or anything else of that kind, so that any condition that might perform that circuit would have the tendency to eliminate the spark. As far as returning the current back into the apparatus where the circuit would go to where it once reached the ground and then got back again, no electrician could tell how it happened in the case of 2200 volts. In the case of 110 volts that is predicated on defective insulation somewhere and does not always find its way back in a case of low voltage. It is possible that if there was a defect at the point of entrance and another where the secondary wire entered the transformer, that it might ground through the case between those two points, although those bushings are designed for that purpose. A practical man accustomed to machinery of this sort would be able to say whether an arc of that kind had occurred in there. He would notice it on the lead itself. I heard Mr. Mosby testify here, and he said from an examination of these wires there was no evidence of an electrical effect. If there had been such an entrance, we would all expect to see evidence of such an electrical breakdown. The light wiring universally put in is of sufficient leaway or of sufficient factor of safety to carry a somewhat [126] higher voltage than the normal rate. It will carry a nominal voltage of 250 volts, but I have tested the wire and put 1500 volts on it but it did not break

(Testimony of B. H. Clingerman.)

down, so there would be no particular danger from 110 to 120 volts. [127]

Testimony of J. C. Dow, for Defendant.

J. C. DOW, a witness called on behalf of the defendant, having been first duly sworn, was examined in chief by Mr. Grosscup, and testified as follows:

Mr. SMITH.—We will admit Mr. Dow's qualifications.

Mr. DOW.—I am operating engineer for the Great Falls Power Company. I have occupied that position since last May. I have had practical experience with electrical apparatus for eighteen years.

Q. Mr. Dow, it is admitted in this case that this sawmill building belonging to the Jordan Lumber Company burned down on Christmas morning, 1917. The sawmill had been in operation practically for five years or more. The sawmill employed a number of motors inside for driving machinery. Those motors were supplied with electrical current from the plant of defendant—the Northern Idaho and Montana Power Company—by means of a high-voltage line from the power plant to Columbia Falls, where it was transformed into approximately 2300 volts, and a line built from the station to mill, a distance of about one and a quarter mile. At the mill at the termination of the 2300 volt line, there was placed a bank of 30–K. W. transformers. It was a three-phase system. From one of these transformers there was a line intended to supply the mill and an adjacent cottage—perhaps two cottages—with elec-

(Testimony of J. C. Dow.)

tric light. The lights and lighting wires inside the mill were enclosed in metallic or steel conduits with the ordinary form of connection for droplights. Now, that in a general way, was the situation. There has been some testimony introduced in this case showing, or tending to show, that when the machinery in the mill—I mean the motor machinery in the mill and the attached mechanical appliances—were in operation, that these lights [128] became somewhat dim and that a flat-iron in a cottage did not heat up in the normal way. That when the motors of the mill were shut off and were not operating any machinery that the lights brightened up in a short time. From that circumstance would you attribute any defect either in the installation or maintenance of or operation of the electrical machinery and appliances, up to and including the transformer?

A. No. That is a common occurrence in appliances of that character for lights to operate or act in that way. It is universal with an installation of that kind.

Q. There is some testimony tending to show, or possibly tending to show that a distance of something more than 100 feet—I think about 200 feet—or about 125 feet—from the transformer on a point carrying three wires, there was placed three lightning-arresters and that after the fire it was seen that one of these lightning-arresters had a very close contact or approaching a contact between two or more of the cylinders at the entrance end. Two or more of

(Testimony of J. C. Dow.)

these cylinders were so close together that a sheet of paper would not slide between them. Would you attribute to that condition of the lightning-arrester, any disturbance or disorder likely to cause a fire?

A. I would say that that condition indicated that the lightning-arrester had been performing its function, and that the condition would not be a probable cause of fire.

Q. At the time of the fire—or during the progress of the fire—I wish to add this additional information concerning the transformers: They were installed in February, 1914, and had been in use thereafter a little less than two years. They were mounted on cross-arms and attached to two poles about 18 feet above the surface of the ground. I mean by ground the earth. [129] The poles were considerably higher than that. During the progress of the fire, the poles—one of them—burned down and the cross-arm became partially burned. At any rate the transformer fell to the ground—one of the transformers turned over in the process of falling, or at least it was found turned upside down. The covering plate was broken, but broken so that it showed that it was a recent break, and was bright with no electrical action indicated. Neither—none of the wiring either inside of the transformer leading to the coils, or from the coils showed any indication of electrical action, or the influence of electrical action or current. The transformer was tested out, the coils not being rewound as it had a temperature of 2,000

(Testimony of J. C. Dow.)

volts, and then subsequently had a pressure of 4,000 volts, and no puncture was found in the transformer nor any other disorder. The wiring going in from the high side was put in in such a way so that the wires could not come in contact with each other or in contact with the secondary wire.

Under these conditions, would you say that the existence or nonexistence of a ground wire from the neutral on the secondary side to the ground, would have had any influence whatever to prevent a fire in the sawmill in question?

A. There are so many other conditions that would have to be involved that it is impossible to answer the question satisfactorily. To prevent loss of life and fire hazard in case an accidental condition arises in the transformer, which would cause a contact between the primary and the secondary circuits. If there is no evidence that there has been a contact between the primary and the secondary circuits, or any evidence of a disturbance of the functional operation of the transformer, then in that case the ground of the neutral or secondary would not serve any particular [**130**] purpose, and assuming that the transformer was performing its functions, the failure to have that ground wire would not be any cause to which you could attribute the existence of a fire.

The purpose of grounding the conduits is to prevent an arc taking place between the conduit and water-pipes and other pipes around, and if it is shown that these conduits were in close proximity to the metal blowpipes, the grounding of these sockets

(Testimony of J. C. Dow.)

would have influence on the sustaining of the spark between the blowpipes and the conduits. If those conduits happened to be covered with such inflammable substances as wood dust and there was a defect in the wiring system which caused the leakage of current into the conduits, then and without such a ground, it would be quite possible for a spark to ignite that inflammable material. This would be prevented by means of grounding the conduits.

If this fire was caused by electricity at all, and if this transformer was working perfectly and you had no evidence of any additional defects at the time, and the conduits were not grounded, you could attribute the cause of the fire—such an electrical fire—if there was one, to various possibilities, all of them more or less remote. There are many possibilities. I don't know that it would be possible to give preference to any one. To state some of them—the conduits not being grounded, if one of the wires within the conduit should come in contact with the conduit, one of the other wires coming in contact with the ground or with the outside of this conduit might cause an arc to be formed on the outside of the conduit, which would set fire to the inflammable material. I said one of the other wires, as I would very much suppose that the conduit itself was near enough to the ground so that an arc might become established. There [131] are many conditions that are necessary to suppose before such a fire could be established in such a way. A defective socket might short circuit at any time, whether it was in use or not, and

(Testimony of J. C. Dow.)

whether it had a lamp in it or not, and if the fuse were of too large capacity the arc might be maintained on the cord to burn the cord off and cause the socket to drop and set fire to the inflammable material. We can presuppose many other conditions that might cause an electrical fire, and all wholly independent of the failure of the transformer to perform its functions. We frequently have electrical fires in which we cannot find the cause because the evidence is nearly always destroyed. There are many fires supposed to be electrical fires simply because there are electric wires in the building.

Cross-examination.

(By Mr. SMITH.)

In my business you can never tell what contingency might arise or what accident might occur in order to make a short circuit, or produce a fire or some accident of that kind. We try our best to guard against just such contingencies.

Q. And the grounding of a neutral wire on a transformer is one of the precautions you take, isn't it?

A. It has been operated by the underwriters in the past, but I have followed the practice many years and still follow it in connection with the Great Falls Power Company. It alters the hazards but in the long run it reduces the hazard—it reduces the total hazards but it alters them.

Q. This condition that you have said might be apprehended [132] or feared at any time if a plant of this kind, in relation to this conduit system could all be eliminated from consideration here could

(Testimony of J. C. Dow.)

it not and discarded, if there had been a grounding of the neutral wire on the transformer that brought the current into the building?

A. Not all. That would increase the fire hazard and reduce the life hazard.

The hazard due to the failure of the transformer would be reduced by the grounding of the secondary coming together in the transformer, but that is something we try to avoid. As to whether grounding the neutral will take care of the hazard entirely depends on the efficiency of the ground and various other conditions. It reduces it.

Q. Now, I will get you back to the other proposition: If this fire were caused by a contact between the primary and the secondary in the transformer, or some defect in the transformer, and there had been a neutral grounding on the transformer which had taken care of the condition that was brought about by the defective wiring there getting together, then it wouldn't make any difference what the condition of the conduit system in the mill was, would it?

A. I cannot say that it would.

Q. And it wouldn't make any difference whether it would be grounded or not? A. No.

Mr. SMITH.—That is all. [133]

Redirect Examination.

(By Mr. GROSSCUP.)

I have said that on the whole I think the fire hazard is increased by grounding the neutral. A fire can very easily be influenced by a short circuit of 110 volts lighting circuit, and that short-circuit ground

(Testimony of J. C. Dow.)

can come about by direct contact between the two wires or by each wire being grounded and an arc being formed at either place of grounding. If one wire is permanently grounded such as the grounding of a neutral, one other ground is sufficient to cause a short circuit which might easily form a fire, and if neither wire is grounded it necessitates two accidental ground conditions to produce a short circuit and to make a fire. In other words with the neutral not grounded, the chances are less then that the short circuit will occur to produce a fire. It takes two groundings to produce a condition that is most likely to cause a fire. This is a condition to be guarded against, that is, the condition which arises from grounding, and if in this case, the transformer did perform its functions then the fire hazard would have been increased by grounding the neutral.

Mr. GROSSCUP.—That is all.

Recross-examination.

(By Mr. SMITH.)

I am familiar in a general way with the Manuel of the National Board of Underwriters.

Q. I call your attention to paragraph 14, line 29, and to paragraph 15, line 31, and I will read to you shortly (reading): "Where transformers are to be connected to high-voltage [134] circuits, it is necessary in many cases for best protection of life and property, that the secondary system be permanently grounded and provision should be made for it when the transformers are built." Do you agree with that? A. I do.

(Testimony of J. C. Dow.)

Q. Here is another one (reading):

"B—Transformers secondaries of distributing systems (except where supplied from private industrial power or lighting plants where the primary voltage does not exceed 550 volts) must be grounded, provided the maximum difference of potential between the grounded point and any other point in the circuit does not exceed 150 volts, and may be grounded when the maximum difference of potential between the maximum difference potential between the grounded point and any other point in the circuit exceeds 150 volts. In either case the following rules must be complied with:

1—The grounding must be made at the neutral point or wire, whenever a neutral point or wire is accessible.

2—When no neutral point or wire is accessible, one side of the secondary circuit must be grounded.

3—The ground connection must be at the transformers or on the individual service, as provided in Section c to g, inclusive, and when transformers feed systems with a neutral wire, the neutral wire must also be grounded at least every 500 feet."

Do you agree with that, that it is a reasonable rule and founded on experience?

A. As a precaution to life. I do not consider it a precaution to fire at all. For many years the National Board of Fire Underwriters refused to permit such a grounding presumably because it increased the fire hazard.

(Testimony of J. C. Dow.)

Q. It is a regulation of the Board of Fire Underwriters, isn't it?

A. I know but they also consider the life hazard.

Mr. SMITH.—That is all. [135]

IN REBUTTAL EVIDENCE.

Testimony of William L. Kimmel, for Plaintiff (In Rebuttal).

KIMMEL, having been previously sworn was recalled in rebuttal, and testified as follows:

I recall when the witness Miller was on the stand that his attention was called to a certain conversation had in Judge Erickson's office. Mr. Utter and Mr. McDonald and Mr. Erickson, the attorney here, and I think Mr. Stiles also were present. He said in that conversation that the transformer at the time he saw it, was on fire.

Q. And is that the thing you told the Court you had in mind when you went outside of the hypothetical question this morning.

A. That was the exact thing.

Testimony of Fred Utter, for Plaintiff (In Rebuttal).

UTTER, having been previously sworn, was recalled in rebuttal and testified as follows:

I was present at a conversation in Mr. Erickson's office, that has just been referred to, at which Carl Miller was present. His attention was called to it this morning. Miller said in substance that the transformer was on fire or was burning.

(Testimony of Fred Utter.)

Cross-examination.

(By Mr. LOGAN.)

Q. Did he say transformer or the transformer pole?

A. He said transformer. I asked him if he was sure the transformer was burning and he said it was, and I asked if the lead was on and he said it was, and I said where was the fire coming from, and he said from inside of the transformer. [136]

Testimony of Charles H. Stiles, for Plaintiff (In Rebuttal).

STILES, having been previously sworn, was recalled for examination in rebuttal and testified as follows:

I was present at that conversation. Carl Miller said in substance that the transformer was on fire. He said it was burning on the inside.

That is all.

Plaintiff rests. [137]

That the decision and opinion of said Court and said cause was in writing, and omitting title of Court and Cause is as follows:

Opinion and Decision.

"The complaint alleges plaintiff's planing-mill was destroyed by fire caused by electric current escaping by reason of defendant's negligent construction and maintenance of its instrumentalities devoted to supplying such current for power and light to said mill.

The answer denies the cause of the fire and any defendant's negligence.

Trial to the Court the Court finds for plaintiff and against defendant, and for damages in the amount of Thirty-four Thousand Five Hundred Dollars.

That the fire was caused by the electric current is demonstrated to a reasonable probability by a preponderance of the evidence. In any case of a burned building wherein is electric current, there is possibility the current caused the fire; and if all other causes are fairly eliminated by the evidence the possibility becomes a reasonable probability. Because from the nature of the thing comparatively often electric current negligently or accidentally can and does escape and set fire. In this case the day and hour of the fire, the weather, the location of the mill, its idle state, war times, fairly exclude likelihood that the fire was caused by mill employees, lightning, hoboes or passing trains, etc. Furthermore, the electric instrumentalities both within and without the mill are proven to have been so defective that because thereof the current would likely escape and set fire. When evidence discloses a sufficient and probable cause of an effect,—more probable than any other cause it is a reasonable inference that the more probable cause produced [138] the effect; and that inference must be drawn.

But was the escape of the current accidental or negligent and if the latter, whose was the negligence?

At the time of the fire, the power switch was open; the light switch was closed. Within the mill the instrumentalities were plaintiff's, a year before the fire they had been condemned by the insurance underwriters, and they were still in process of uncompleted

change at odd times by plaintiff's planerman and men supervised by him. It's a resistless inference the system within the mill was a fire hazard, because of which plaintiff was without insurance at the time of the fire.

Without the mill the instrumentalities were defendant's Forty-eight feet from the mill were the transformers and 125 feet beyond them and upon the primary wires were the lightning-arresters. From inspection and testing after the fire, it appears and without real conflict that one of these arresters was in an obviously defective condition and which caused it to operate as a continuous ground of the primary wires. It likewise appears that this grounding of the primary wires would tend to induce grounding elsewhere, creating a condition favorable to fire—probably a sustained arc likely to fire any inflammable material adjacent. The conditions in the mill, the nature of the wiring therein, and the fire, all render it probable that the continuous ground at the arrester did finally induce grounding in the mill under circumstances that set the fire,—that in view of all the circumstances the fire was caused by the electric current and by the arrester defective and active as aforesaid.

It is true plaintiff's defective instrumentalities might cause fire, but it is more probable that the arrester [139] caused it. To create a condition favorable to set fire there must be two groundings of the wiring. The arrester a continuous ground, would probably set fire whenever another ground was by it induced or which happened in the mill. The plain-

tiff's defective instrumentalities would not set fire until two grounds occurred in the mill. The probabilities are two to one in favor of the theory that the arrester operating with one ground in the mill, as it would, is the cause of the fire.

That the mill's defective instrumentalities might have been an agency of the fire is not suggested by defendant, save that plaintiff's failure to ground its conduits is claimed to be contributory negligence.

Contributory negligence is not pleaded, and does not appear. Plaintiff was not bound to anticipate defendant's negligence. Plaintiff might be willing to hazard all accidental damage which it might avoid by grounding its conduits, but thereby would not assent to or assume the risk of damage from defendant's negligence. So too, of plaintiff's defective instrumentalities in general.

See 232 U. S. 349–353.

See cases cited 29 Cyc. 517.

The arrester defective and causing the fire, the burden is upon defendant to rebut the inference of negligence therefrom arising. Whether the arrester was sound when placed in position, whether due inspection was made, does not appear. See 224 U. S. 95. Herein, is proven the negligence charged by plaintiff against defendant. So far as plaintiff counts upon a defective transformer it has failed. The evidence does not persuade that the transformer was in anywise defective. The complaint filed two months after the fire, contained only a "catch-all" charge of defective instrumentalities. Immediately after the fire [140] plaintiff instituted investigation to fix liabil-

ity upon defendant. Its manager testified he saw the transformer on fire indicating fire within it. But though these transformers fell to the ground by reason of their wires and poles burned by the mill fire, neither he nor any his searchers for evidence even thought to examine them as they lay upon the ground, much less to test them, but passed them by, so they say, to examine and test the arresters. There and elsewhere they saw these transformers repeatedly, and yet they at no time did more than "casually" look at them. No other witness of several at the fire saw the transformer on fire. Plaintiff's principal expert on the scene early to sell motors, etc., to plaintiff, discussed the fire with the manager, but did not conclude that the fire was due to the current until over a year later when he heard an employee of defendant's say the transformer was on fire and another employee say one coil had been rewound. It is inconceivable had the manager seen the transformer on fire within, that he would not have told his searchers and expert, and first proceeded to thorough examination and test of the transformer. It is apparent the said expert had no inkling of it until he heard the said employees as aforesaid. From all they knew and saw, plaintiff's witnesses doubtless concluded the mill fire alone had effected the transformer, until after the employees' statements aforesaid. The charred appearance of the transformer, dragged from one of plaintiff's witnesses at the very end by gross leading, is more likely due to the mill fire.

It was ample thereto, and Utter for plaintiff testifies it appeared as though due to a fire *around* the

transformer. It is true defendant might have submitted more evidence in [141] relation to this transformer, but on the whole the best that can be said of plaintiff's evidence is that it indicates the transformer was affected by fire but no more likely from fire within due to defects than from the mill fire without. So far as appears plaintiff had ample opportunity to know all necessary in respect to the transformers. The manager at the fire was not likely giving serious attention to the transformer. He could now easily confuse a pole afire or even oil boiling out and burning from the mill fire, with fire within the transformer. As for the employees' statements, it need not be pointed out they are not evidence of the facts,—of fire within the transformer due to defects. They serve for impeachment only.

Defendant's failure to ground the secondary wires or neutral was not negligence. To so ground decreases some hazards but increases others. It was and is in doubt which is the better practice so far as fire is concerned. At argument, it was admitted the value of the property destroyed was $30,500.00. Plaintiff's established business of profit was diligently restored five months after the fire. Four thousand dollars for lost profits are sustained by the proof, found and allowed. Some profit seems included in the value of property destroyed. Judgment accordingly.

Decision is late, because until recently the Court understood the case was settled.

Feb. 3, 1919.

BOURQUIN, J. [142]

That thereafter pursuant to stipulations of the parties, the Judge of said Court made an order granting the defendant thirty days' additional time within which to prepare and serve its Bill of Exceptions.

And thereafter and pursuant to stipulation of the parties, the Judge of said Court made an order granting the defendant sixty days in addition to the time allowed by law and the previous order of the Court, in which to prepare and serve its Bill of Exceptions.

Now comes the defendant, Northern Idaho & Montana Power Company, and submits herewith this, its proposed Bill of Exceptions.

Dated this 6th day of May, 1919.

B. S. GROSSCUP,
SIDNEY M. LOGAN,
Attorneys for Defendant.

Service of the foregoing Bill of Exceptions accepted this 6th day of May, 1919.

HENRY C. SMITH,
FOOT & MacDONALD,
J. E. ERICKSON,
Attorneys for Plaintiff. [143]

Order Settling Amended Bill of Exceptions.

United States of America,
District of Montana,—ss.

I, George M. Bourquin, Judge of the District Court for the District of Montana, do hereby certify that the foregoing is a full, true and correct bill of exceptions in said action, and that the recitals therein regarding the testimony introduced are true and correct and the same is now by me hereby settled, allowed

and approved as a true and correct bill of exceptions in said action.

Dated in open court this 13th day of June, 1919.

BOURQUIN,

Judge.

Filed June 13th, 1919. C. R. Garlow, Clerk. [144]

Thereafter, on July 23, 1919, assignment of errors was duly filed herein, as follows, to wit:

(Title of Court and Cause.)

Assignment of Errors.

Now comes the plaintiff in error, by its attorneys Benjamin S. Grosscup and Sidney M. Logan, and makes and files its assignment of errors as follows:

I.

The trial Court erred in finding and holding that the fire which destroyed plaintiff's mill was of electrical origin or attributable to electrical causes.

II.

The trial Court erred in finding and holding that the fire which destroyed plaintiff's mill was attributable to any cause or instrumentality over which the defendant had control, and particularly erred in drawing the inference and in finding that the fire was of electrical origin from the following facts found by the Court:

> "That the fire was caused by the electric current is demonstrated to a reasonable probability by a preponderance of the evidence. In any case of a burned building wherein is electric cur-

rent, there is possibility the current caused the fire; and if all other causes are fairly eliminated by the evidence the possibility becomes a reasonable probability. Because from the nature of the thing comparatively often electric current negligently or accidentally can and does escape and set fire. In this case the day and hour of the fire, the weather, the location of the mill, its idle [145] state, war times, fairly exclude likelihood that the fire was caused by mill employees, lightning, hoboes or passing trains, etc."

III.

The trial Court having found:

"The electric instrumentalities both within and without the mill are proven to have been so defective that because thereof the current would likely escape and set fire * * * Within the mill the instrumentalities were plaintiff's; a year before the fire they had been condemned by the insurance underwriters and were still in process of uncompleted change at odd times by plaintiff's planerman and men supervised by him. It is a resistless inference the system within the mill was a fire hazard, because of which plaintiff was without insurance at the time of the fire."

and said finding of the Court being fully sustained by the evidence, the Court erred in attributing the cause of the fire to instrumentalities without the mill over which the defendant had control.

IV.

The Court erred in finding and holding that not-

withstanding plaintiff's negligence in maintaining its electrical appliances within the mill in such manner as to constitute a probable cause of the fire, the plaintiff can recover.

V.

The Court erred in finding as a matter of law that the negligence of the plaintiff in failing to maintain the electrical appliances under its charge within the mill in a safe condition did not constitute a bar to plaintiff's recovery because the defendant did not plead contributory negligence.

VI.

The Court erred in finding that the lightning-arrester outside the building, if detective, was the cause of the fire.

VII.

The Court erred in finding that if said lightning-arrester was found to be defective after the fire, defendant is responsible [146] for such defect, it appearing in the undisputed evidence that whatever defect existed in the lightning-arrester was caused by lightning and the frequent electrical storms that occurred after the ordinary season of inspection in the spring of the year.

VIII.

The Court erred in his conclusions arrived at from his findings of fact.

IX.

From the findings of fact, judgment should have been entered for the defendant.

WHEREFORE plaintiff in error prays that the judgment of the United States District Court for the

District of Montana may be reversed and the cause remanded to the District Court with orders to dismiss.

BENJAMIN S. GROSSCUP,
SIDNEY M. LOGAN,
Attorneys for Plaintiff in Error.

Assignment of errors called to the attention of and noted this —— day of July, 1919.

_____

Judge.

Filed July 23, 1919. C. R. Garlow, Clerk. [147]

Thereafter, on July 23, 1919, petition for writ of error was filed herein, as follows, to wit:

(Title of Court and Cause.)

Petition for Writ of Error.

To the Honorable GEO. M. BOURQUIN, Judge of said Court:

Now comes the plaintiff in error in the above-entitled cause and represents to your Honorable Court:

I.

That heretofore in that certain cause wherein A. L. Jordan Lumber Company was plaintiff and Northern Idaho and Montana Power Company defendant in the District Court of the United States for the District of Montana, parties having waived a jury, the Court heard the evidence and argument of counsel and thereafter on the 3d day of February, 1919, the District Judge before whom said cause was tried filed a written opinion embracing his finding in fact.

Thereafter on the 5th day of February, 1919, judgment was entered in favor of the plaintiff in the court below, for the sum of $34,500.00 damages and $577.40 costs. That thereafter and heretofore the plaintiff in error herein, the defendant in the court below, duly filed its bill of exceptions, which bill of exceptions was settled and made a part of the record in said cause in the District [148] Court and thereafter and heretofore the plaintiff in error has filed its assignment of errors and caused the same to be made a part of the record in the District Court.

The Northern Idaho and Montana Power Company, the defendant in the court below, plaintiff in error herein, charges and alleges that the judgment of the District Court for the District of Montana was erroneously entered in favor of the defendant in error and that such judgment should have been made and entered in favor of the plaintiff in error.

WHEREFORE the plaintiff prays that a writ of error issue in its behalf out of the United States District Court for the District of Montana for the correction of the errors so complained of and that a transcript of the record of the proceedings and all things necessary be sent to the United States Circuit Court of Appeals for the Ninth Circuit.

B. S. GROSSCUP,
SIDNEY M. LOGAN,
Attorneys for Plaintiff in Error.

Filed July 23, 1919. C. R. Garlow, Clerk. [149]

Thereafter, on July 23, 1919, order allowing writ of error was duly made and entered herein, as follows:

(Title of Court and Cause.)

Order Allowing Writ of Error.

Now, on this 23d day of July, A. D. 1919, comes the plaintiff in error, Northern Idaho and Montana Power Company, by its attorneys, and presents to the Court its petition praying for the allowance of a writ of error together with an assignment of errors intended to be urged by it in the Circuit Court of Appeals, praying also that the transcript of record and proceedings in this cause, with all things concerning the same, be sent to the Circuit Court of Appeals for the Ninth Circuit, on consideration whereof the Court does hereby allow the writ of error prayed for, upon the giving of a bond in the penal sum of $500.00, in the form and with sureties approved by the Court for the payment of all costs which may hereafter be assessed against the plaintiff in error in the United States Circuit Court of Appeals for the Ninth Circuit.

BOURQUIN,
Judge.

Filed July 23, 1919. C. R. Garlow, Clerk. [150]

Thereafter, on July 23, 1919, bond on appeal was duly filed herein, as follows, to wit:

(Title of Court and Cause.)

Bond on Appeal.

KNOW ALL MEN BY THESE PRESENTS: That Northern Idaho and Montana Power Company, as principal, and National Surety Company, as surety, are well and truly bound unto A. L. Jordan Lumber Company, the defendant in error in the penal sum of Five Hundred Dollars ($500.00), for the payment of which, well and truly to be made, we bind ourselves, our successors and assigns.

Dated at Tacoma, Washington, this 11th day of July, 1919.

The condition of the above obligation is such that whereas Northern Idaho and Montana Power Company has filed in the Circuit Court of Appeals of the United States a petition in error seeking a reversal of a certain judgment entered against it and in favor of the defendant in error in the United States District Court for the District of Montana in that certain cause wherein A. L. Jordan Lumber Company was plaintiff and Northern Idaho and Montana Power Company was defendant,—

Now, therefore, if Northern Idaho and Montana Power Company, plaintiff in error, shall well and truly pay all costs assessed against it in the United States Circuit Court of Appeals by reason of said proceedings in error, the foregoing [151] obliga-

tion shall be void; otherwise in full force and effect.

NORTHERN IDAHO AND MONTANA POWER COMPANY,
By BENJAMIN S. GROSSCUP,
Its Attorney,
Principal.

NATIONAL SURETY COMPANY,
By FREDERICK D. METZGER,
Resident Vice-President.
[Seal] F. W. SWEETLAND,
Resident Assistant Secretary,
Sureties.

The foregoing bond is approved this 23d day of July, 1919.

BOURQUIN,
Judge.

Filed July 23, 1919. C. R. Garlow, Clerk. [152]

Thereafter, on July 23, 1919, a citation was duly issued herein, which original citation is hereto annexed and is in the words and figures following, to wit: [153]

In the United States Circuit Court of Appeals for the Ninth Circuit.

NORTHERN IDAHO AND MONTANA POWER COMPANY, a Corporation,
Plaintiff in Error,

vs.

A. L. JORDAN LUMBER COMPANY, a Corporation,
Defendant in Error.

Citation on Writ of Error.

To A. L. Jordan Lumber Company and Its Attorneys, GREETING:

You are cited and admonished to be and appear at a session of the United States Circuit Court of Appeals for the Ninth Circuit, to be holden at the City of San Francisco, State of California, within thirty (30) days from the date hereof, pursuant to a writ of error filed in the Clerk's office of the United States District Court for the District of Montana, wherein Northern Idaho and Montana Power Company is plaintiff in error and A. L. Jordan Lumber Company is defendant in error, to show cause, if any there be; why the judgment rendered against the plaintiff in error as in said writ of error mentioned, should not be corrected, and why speedy justice should not be done the party in this behalf.

Dated this 23 day of July, 1919.

GEO. M. BOURQUIN,
Judge.

Copy of within citation received this 26th day of July, 1919.

J. E. ERICKSON,
T. H. McDONALD,
HENRY C. SMITH,
Attorneys for Defendant in Error. [154]

[Endorsed]: No. 583. In the United States District Court, District of Montana. A. L. Jordan Lumber Company, a Corporation, Plaintiff, vs. Northern Idaho and Montana Power Company, a

Corporation, Defendant. Citation on Writ of Error. Filed July 28, 1919, C. R. Garlow, Clerk. [155]

Thereafter, on July 23d, 1919, writ of error was duly issued herein, which original writ is hereto annexed and is in the words and figures following, to wit: [156]

In the United States Circuit Court of Appeals for the Ninth Circuit.

NORTHERN IDAHO AND MONTANA POWER COMPANY, a Corporation,

Plaintiff in Error,

vs.

A. L. JORDAN LUMBER COMPANY, a Corporation,

Defendant in Error.

Writ of Error.

The President of the United States of America, to the Honorable Judge of the District Court of the United States for the District of Montana:

Because of the records and proceedings, as also in the rendition of judgment, which is in the said District Court before you, in that certain action wherein A. L. Jordan Lumber Company was plaintiff and Northern Idaho and Montana Power Company, defendant, manifest error has happened to the great damage of the defendant in the said District Court, as by the record in said court appears, we being willing that error, if any has been done, should be

duly corrected and full and speedy justice done to the party aforesaid in this behalf, do command that you send under seal the record and proceedings, with all things concerning the same, to the United States Circuit Court of Appeals for the Ninth Circuit, together with this writ so that you have the same at the city of San Francisco, in the State of California, where said Court is sitting, within thirty (30) days from date hereof, in the said Circuit Court of Appeals then and there held, that the record and proceedings aforesaid **[157]** be inspected in order that the said Circuit Court of Appeals may cause to be further done what of right and according to the laws of the United States should be done.

WITNESS the Honorable EDWARD DOUGLASS WHITE, Chief Justice of the United States of America, this 23d day of July, 1919.

[Seal] C. R. GARLOW,

Clerk U. S. District Court, District of Montana.

Allowed this —— day of July, 1919, after the plaintiff in error had filed with the clerk of this court its assignment of errors and its petition for writ of error, together with a bond for payment of costs in the said proceeding in error.

_____,

Judge of the United States District Court for the District of Montana. **[158]**

Answer of Court to Writ of Error.

The answer of the Honorable, the United States District Judge for the District of Montana, to the foregoing writ:

The record and proceedings whereof mention is

made, with all things touching the same, I certify under the seal of the said District Court to the Honorable, the United States Circuit Court of Appeals for the Ninth Circuit, within mentioned, at the day and place within contained, in a certain schedule to this writ annexed, as within I am commanded.

By the Court.

[Seal] C. R. GARLOW,
Clerk. **[159]**

[Endorsed]: No. 583. In the United States District Court, District of Montana. A. L. Jordan Lumber Company, a Corporation, Plaintiff, vs. Northern Idaho and Montana Power Company, a Corporation, Defendant. Writ of Error. Filed July 28, 1919. C. R. Garlow, Clerk.

Service of the within and foregoing writ of error by the receipt of a true copy thereof, together with true copies of the exhibits recited therein as being attached thereto, hereby is admited in behalf of all parties entitled to such service by law or by rules of court, this 26th day of July, 1919.

J. E. ERICKSON,
T. H. McDONALD,
HENRY C. SMITH,
Plffs. Attys. **[160]**

Thereafter, on July 28th, 1919, praecipe for transcript was filed herein, as follows, to wit:

(Title of Court and Cause.)

Praecipe for Transcript of Record.

To the Clerk of the United States District Court for the District of Montana:

Please prepare record for the purposes of a writ of error to the United States Circuit Court of Appeals for the Ninth Circuit and include the following:

1. Complaint.
2. Answer.
3. Opinion of the Court ordering judgment.
4. Judgment.
5. Bill of exceptions.
6. Assignment of errors.
7. Order settling bill of exceptions.
8. Petition for writ of error.
9. Writ of error.
10. Citation.
11. Order allowing writ of error.

All captions, verifications, file-marks and endorsements may be omitted.

BENJAMIN S. GROSSCUP,
SIDNEY M. LOGAN,
Attorneys for Plaintiff in Error.

Provisions of the Act approved February 13th, 1911, are hereby waived and you are requested to forward typewritten transcript to the United States

Circuit Court of Appeals for printing under Rule 105 of this court.

BENJAMIN S. GROSSCUP,
Attorney for Plaintiff in Error.

Filed July 28th, 1919. C. R. Garlow, Clerk. **[161]**

Certificate of Clerk U. S. District Court to Transcript of Record.

United States of America,
District of Montana,—ss.

I, C. R. Garlow, Clerk of the United States District Court for the District of Montana, do hereby certify and return to the Honorable, The United States Circuit Court of Appeals for the Ninth Circuit, that the foregoing volume, consisting of 161 pages, numbered consecutively from 1 to 161, inclusive, is a full, true and correct transcript of the record and all proceedings had in said cause required to be incorporated in the record on appeal therein by the praecipe of the plaintiff in error, and of the whole thereof, as appears from the original records and files of said court in my custody as such clerk; and I do further certify and return that I have annexed to said transcript and included within said pages the original Citation and Writ of Error issued in said cause.

I further certify that the costs of the transcript of record amount to the sum of Seventy-five and 25/100 Dollars, ($75.25), and have been paid by plaintiff in error.

In Witness Whereof I have hereunto set my hand

and affixed the seal of said court, at Helena, Montana, this 22d day of August, A. D. 1919.

[Seal] C. R. GARLOW,
Clerk. **[162]**

[Endorsed]: No. 3382. United States Circuit Court of Appeals for the Ninth Circuit. Northern Idaho and Montana Power Company, a Corporation, Plaintiff in Error, vs. A. L. Jordan Lumber Company, a Corporation, Defendant in Error. Transcript of Record. Upon Writ of Error to the United States District Court of the District of Montana.

Filed August 25, 1919.

F. D. MONCKTON,
Clerk of the United States Circuit Court of Appeals for the Ninth Circuit.

By Paul P. O'Brien,
Deputy Clerk.

United States Circuit Court of Appeals for the Ninth Circuit.

No. ——.

NORTHERN IDAHO & MONTANA POWER COMPANY, a Corporation,
Plaintiff in Error,

vs.

A. L. JORDAN LUMBER COMPANY, a Corporation,
Defendant in Error.

Order Extending Time for Filing Transcript on Appeal.

For good cause appearing to the Court, it is hereby ordered that the time for filing the record on appeal in the United States Circuit Court of Appeals for the Ninth Circuit, in the above-entitled action, be and is extended for a period of ten days.

Dated August 19, 1919.

BOURQUIN,
Judge.

[Endorsed]: No. 3382. United States Circuit Court of Appeals, Ninth Circuit. Northern Idaho & Montana Power Co., Plaintiff in Error, vs. A. L. Jordan Lumber Co., Defendant in Error. Order Extending Time for Filing Transcript on Appeal. Filed Aug. 22, 1919. F. D. Monckton, Clerk. Refiled Aug. 25, 1919. F. D. Monckton, Clerk.

In the United States Circuit Court of Appeals for the Ninth Circuit.

NORTHERN IDAHO AND MONTANA POWER COMPANY, a Corporation,
Plaintiff in Error,

vs.

A. L. JORDAN LUMBER COMPANY, a Corporation,
Defendant in Error.

Stipulation Under Rule 23, C. C. A.

IT IS STIPULATED in the above-entitled cause between the plaintiff in error, by and through its attorneys, Logan & Childs, and the defendant in error, by and through its attorney, J. E. Erickson, that the exhibits certified by the clerk of the District Court may be omitted from the printed record, and the printing of said exhibits is hereby waived.

This stipulation is made under Rule 23 of the Circuit Court of Appeals.

Dated this 30th day of August, 1919.

LOGAN & CHILDS,
Attorneys for Plaintiff in Error.
J. E. ERICKSON,
Attorney for Defendant in Error.

[Endorsed]: No. 3382. In the United States Circuit Court of Appeals, Ninth Circuit. Northern Idaho and Montana Power Company, a Corporation, Plaintiff in Error, vs. A. L. Jordan Lumber Company, a Corporation, Defendant in Error. Stipulation Under Rule 23. Filed Sep. 8, 1919. F. D. Monckton, Clerk.